FIG. 1

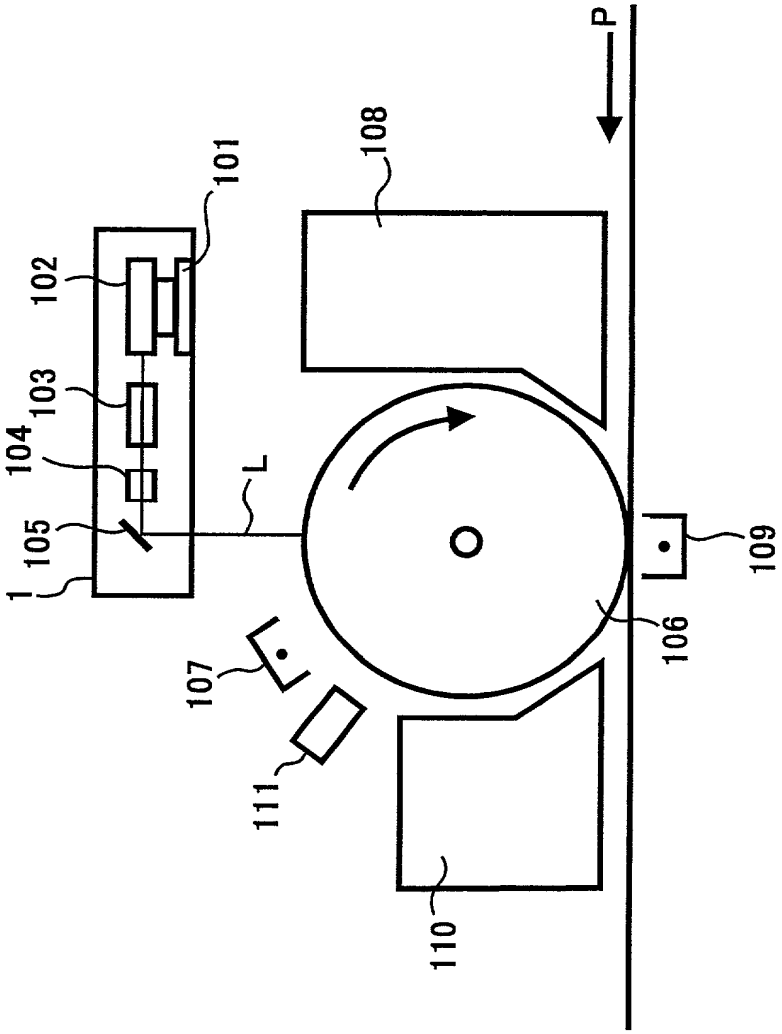


FIG. 2

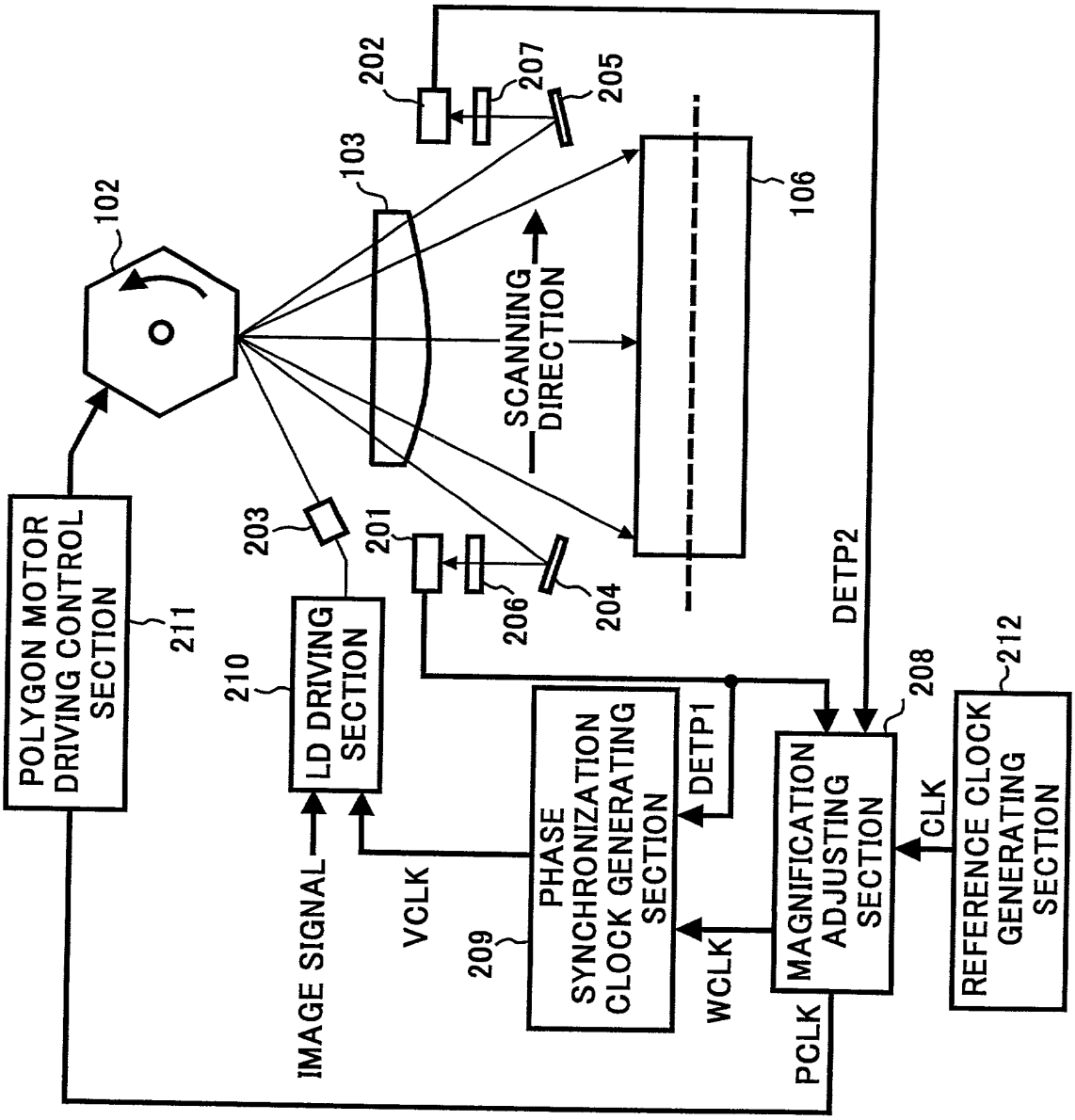

POLYGON MOTOR DRIVING CONTROL SECTION
211
102
103
202
207
205
106
SCANNING DIRECTION
203
201
206
204
210
LD DRIVING SECTION
IMAGE SIGNAL
VCLK
209
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION
DETP1
DETP2
208
MAGNIFICATION ADJUSTING SECTION
WCLK
PCLK
CLK
212
REFERENCE CLOCK GENERATING SECTION

FIG. 3

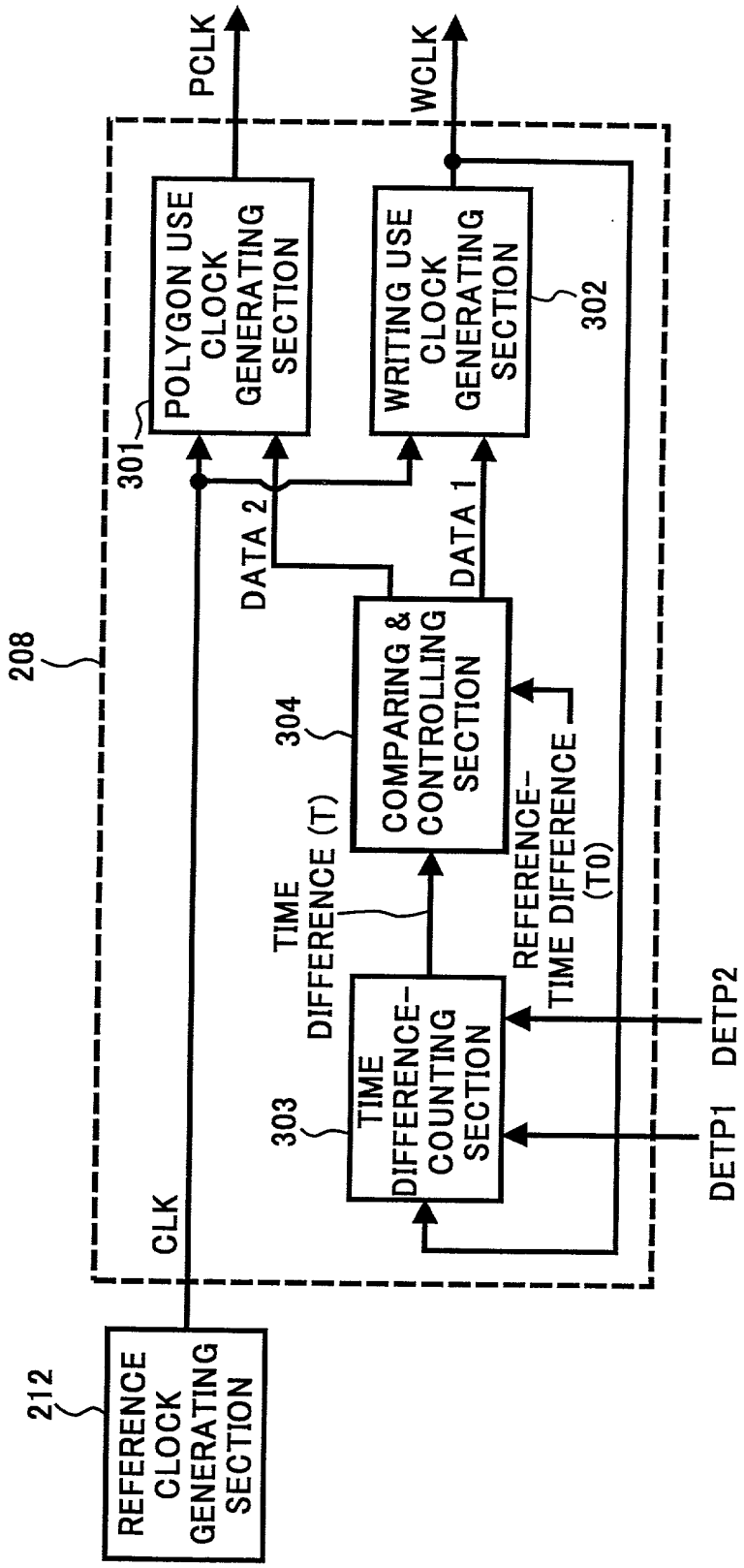

208
212
REFERENCE CLOCK GENERATING SECTION
CLK
301
POLYGON USE CLOCK GENERATING SECTION
PCLK
302
WRITING USE CLOCK GENERATING SECTION
WCLK
DATA 2
DATA 1
304
COMPARING & CONTROLLING SECTION
TIME DIFFERENCE (T)
REFERENCE-TIME DIFFERENCE (T0)
303
TIME DIFFERENCE-COUNTING SECTION
DETP1
DETP2

FIG. 4

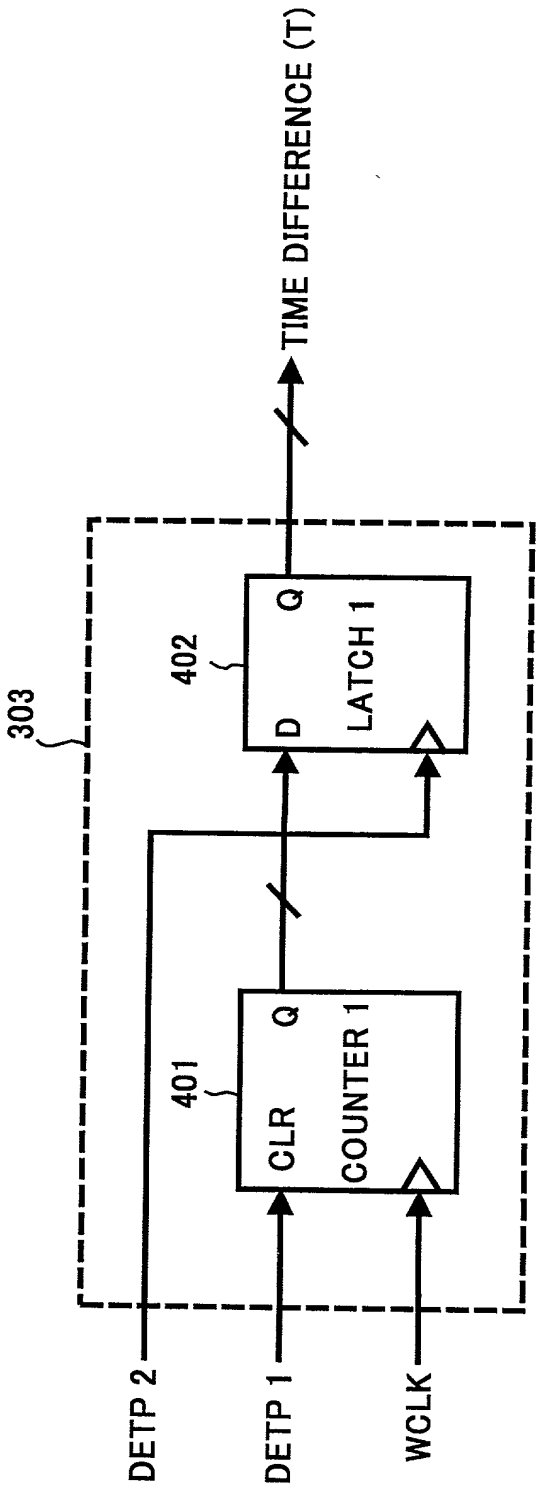

TIME DIFFERENCE (T)
303
402
LATCH 1
D
Q
401
COUNTER 1
CLR
Q
DETP 2
DETP 1
WCLK

FIG. 5

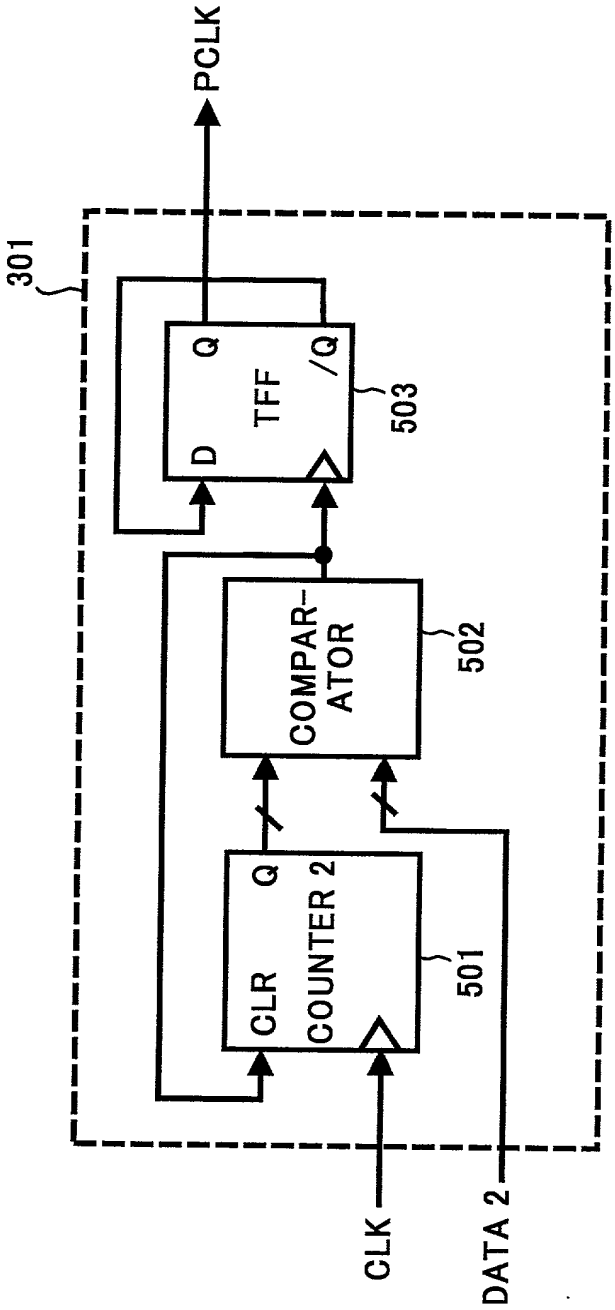

PCLK
301
Q
/Q
TFF
D
503
COMPAR-
ATOR
502
Q
COUNTER 2
CLR
501
CLK
DATA 2

FIG. 6

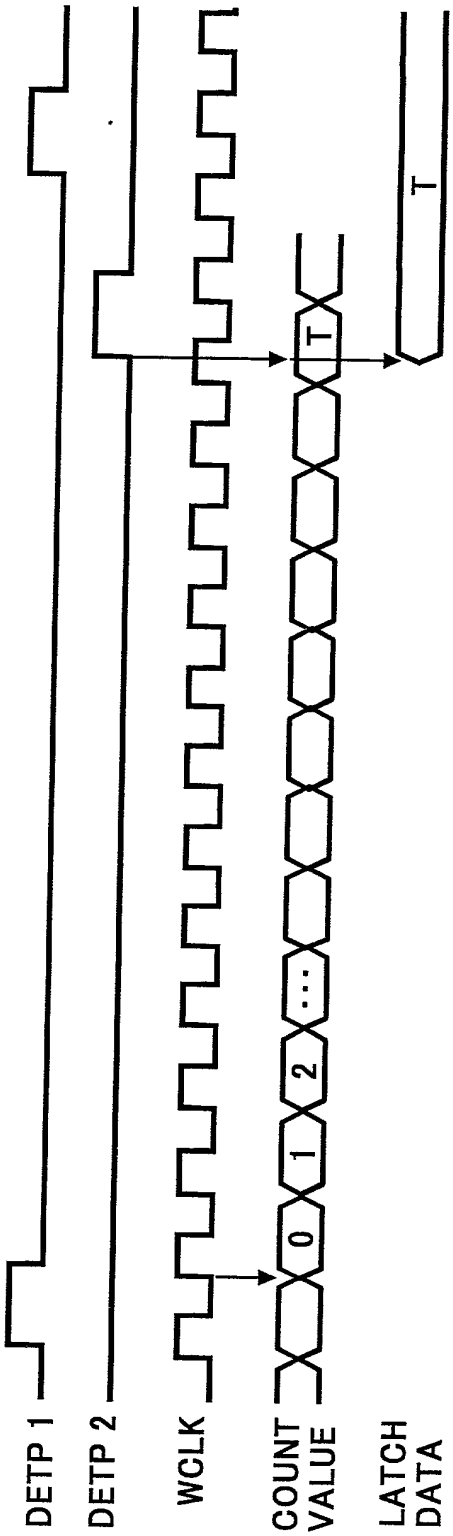


FIG. 7

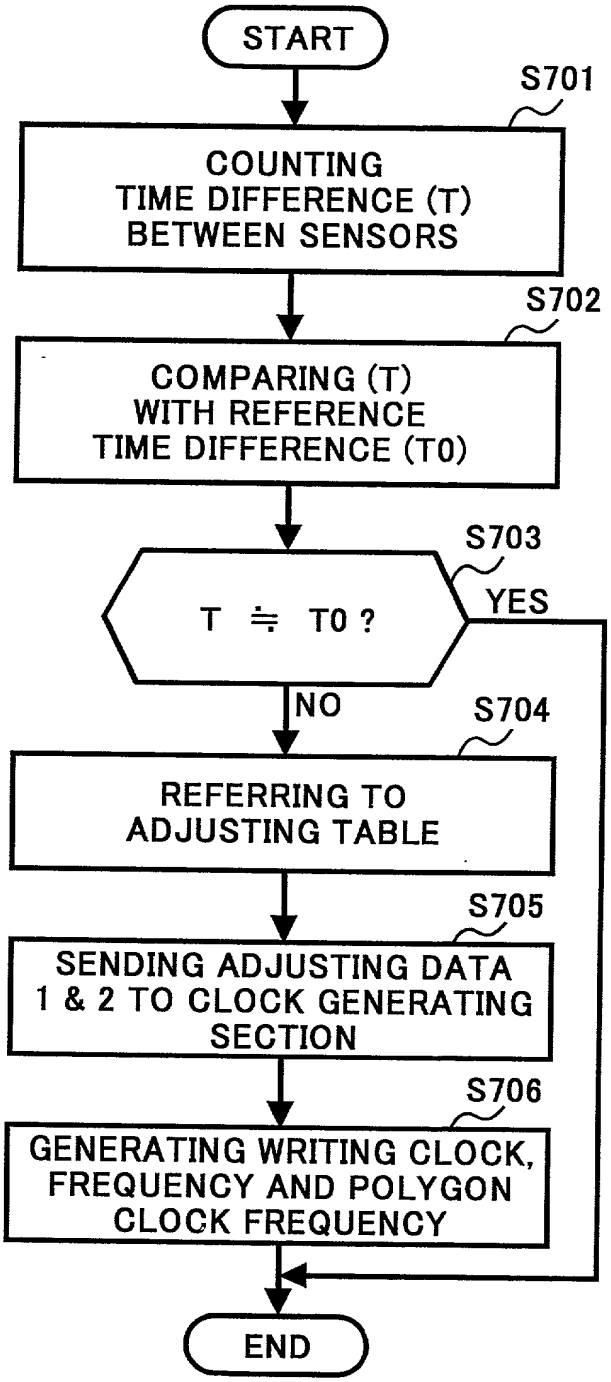

START
S701
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S702
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T0)
S703
T ≒ T0 ?
YES
NO
S704
REFERRING TO ADJUSTING TABLE
S705
SENDING ADJUSTING DATA 1 & 2 TO CLOCK GENERATING SECTION
S706
GENERATING WRITING CLOCK, FREQUENCY AND POLYGON CLOCK FREQUENCY
END

FIG. 8

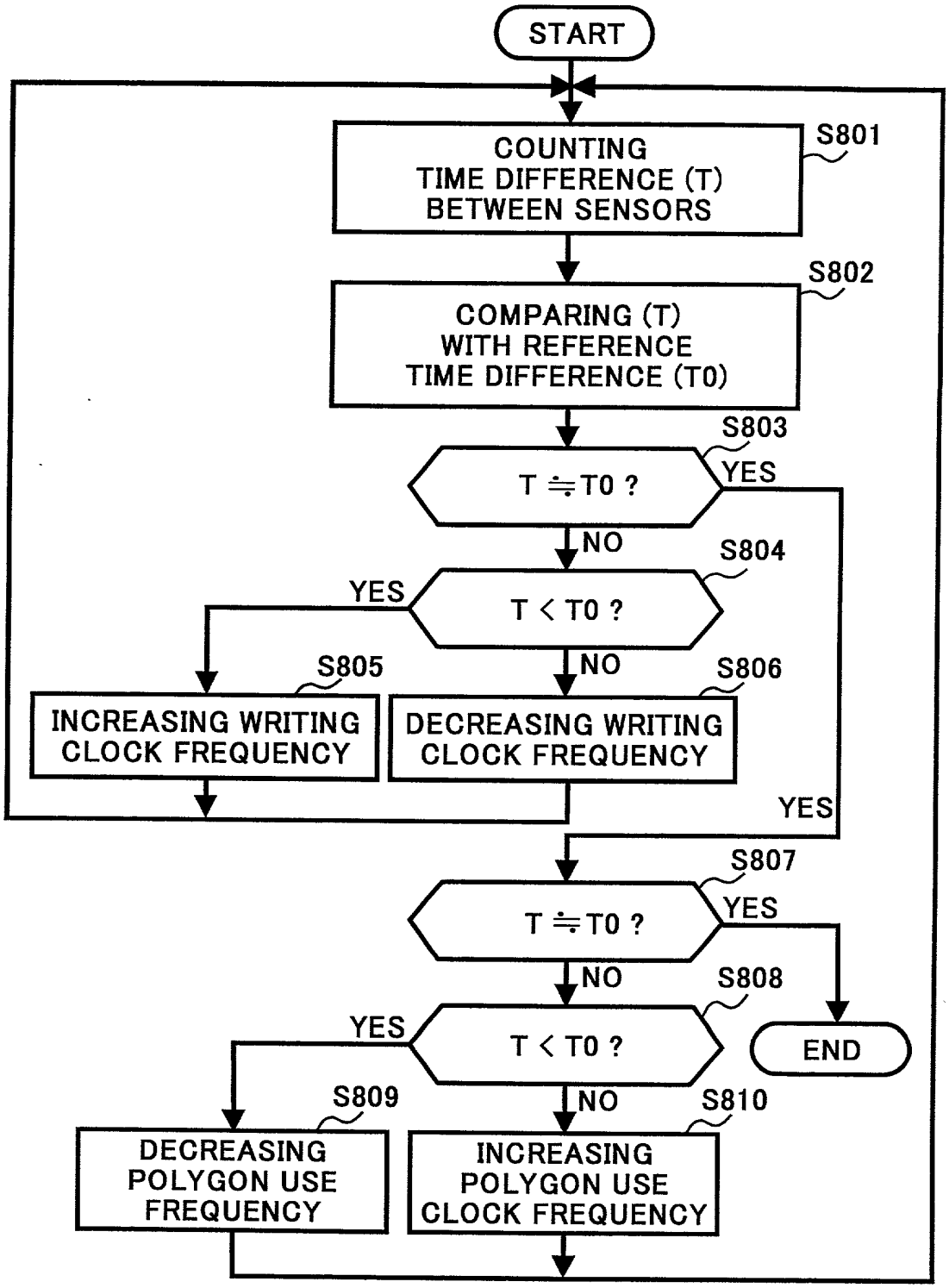

START
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S801
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T0)
S802
S803
T ≒ T0 ?
YES
NO
S804
YES
T < T0 ?
NO
S805
S806
INCREASING WRITING CLOCK FREQUENCY
DECREASING WRITING CLOCK FREQUENCY
YES
S807
T ≒ T0 ?
YES
NO
S808
YES
T < T0 ?
END
NO
S809
S810
DECREASING POLYGON USE FREQUENCY
INCREASING POLYGON USE CLOCK FREQUENCY

FIG. 9

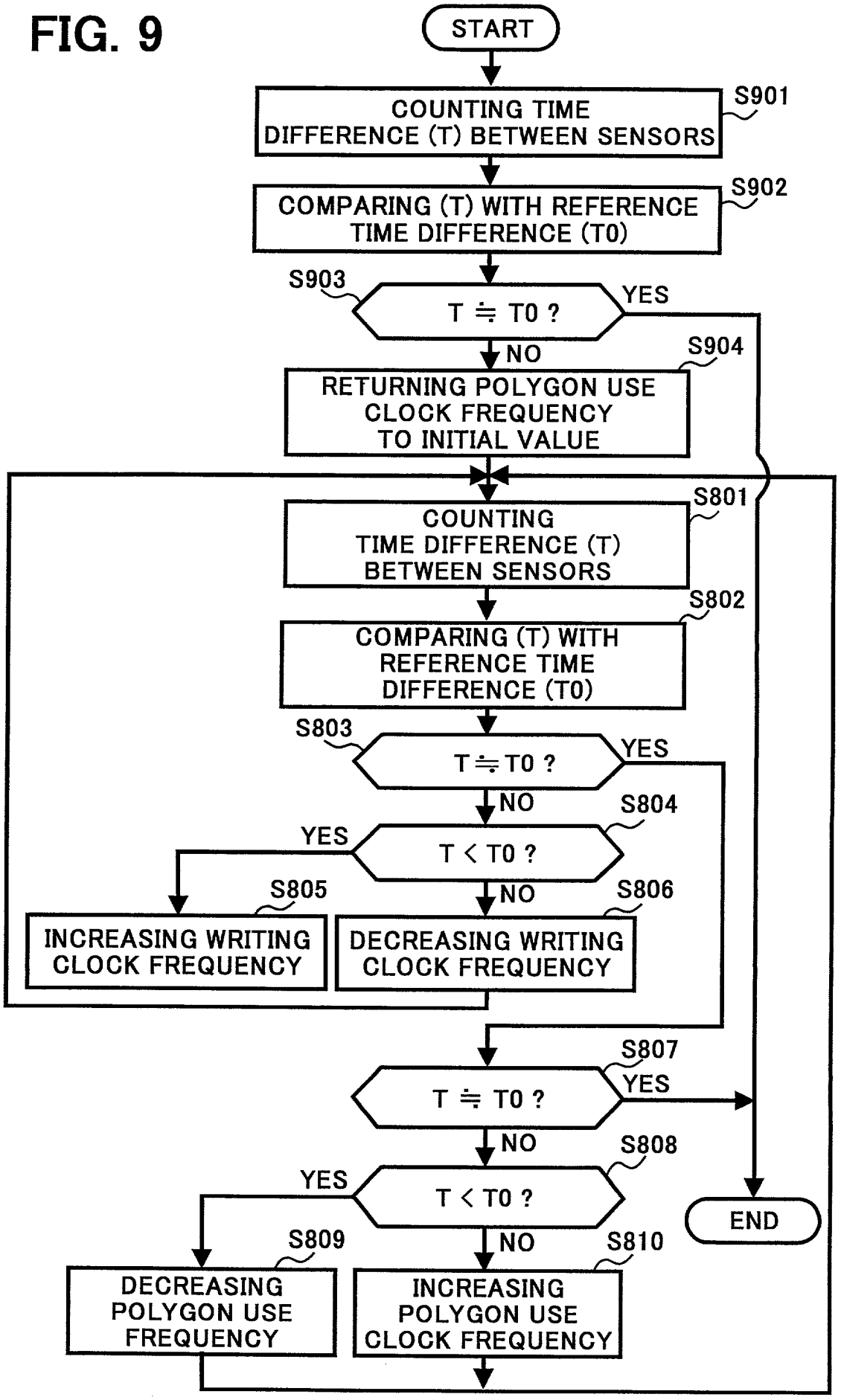

START
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S901
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T0)
S902
S903
T ≒ T0 ?
YES
NO
S904
RETURNING POLYGON USE CLOCK FREQUENCY TO INITIAL VALUE
S801
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S802
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T0)
S803
T ≒ T0 ?
YES
NO
S804
T < T0 ?
YES
NO
S805
INCREASING WRITING CLOCK FREQUENCY
S806
DECREASING WRITING CLOCK FREQUENCY
S807
T ≒ T0 ?
YES
NO
S808
T < T0 ?
YES
NO
END
S809
DECREASING POLYGON USE FREQUENCY
S810
INCREASING POLYGON USE CLOCK FREQUENCY

FIG. 10

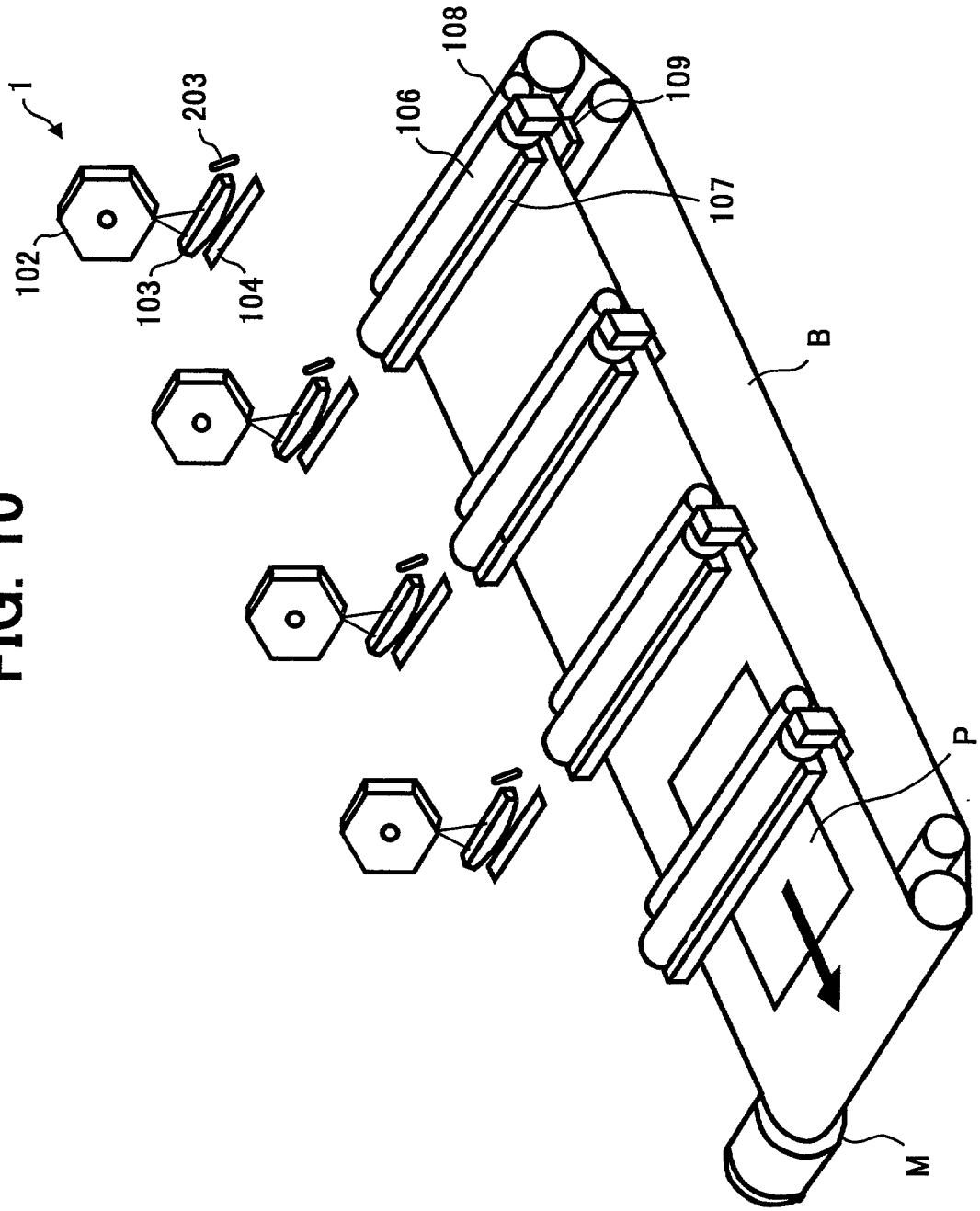


FIG. 11

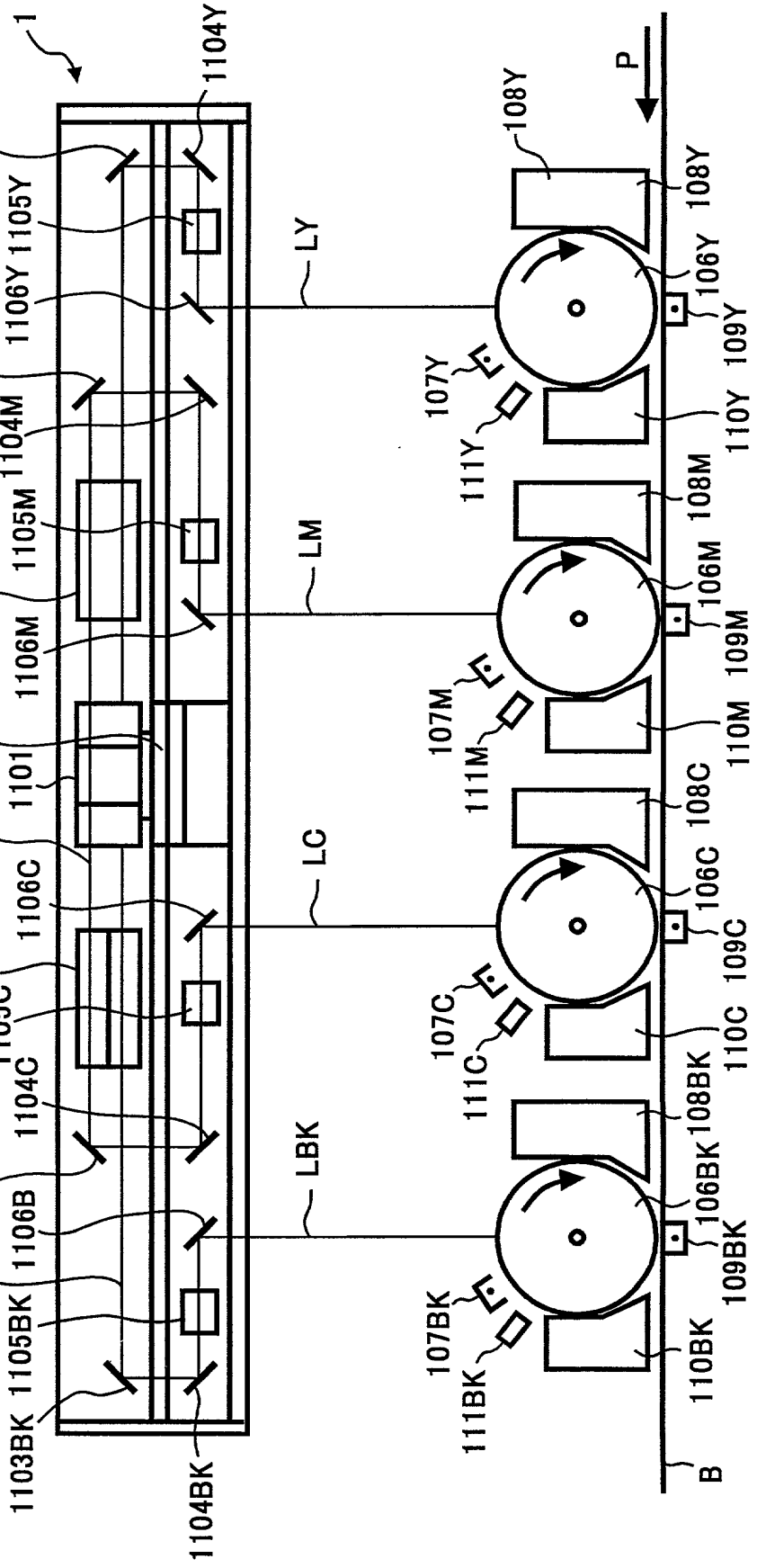

1
1103Y
1104Y
1105Y
1106Y
LY
1103M
1104M
1105M
1102MY
1106M
LM
1107
1101
L2
1106C
1102BKC
1105C
1104C
1103C
LC
L1
1106B
1105BK
1103BK
1104BK
LBK
P
108Y
106Y
109Y
107Y
111Y
110Y
108M
106M
109M
107M
111M
110M
108C
106C
109C
107C
111C
110C
108BK
106BK
109BK
107BK
111BK
110BK
B

FIG. 12

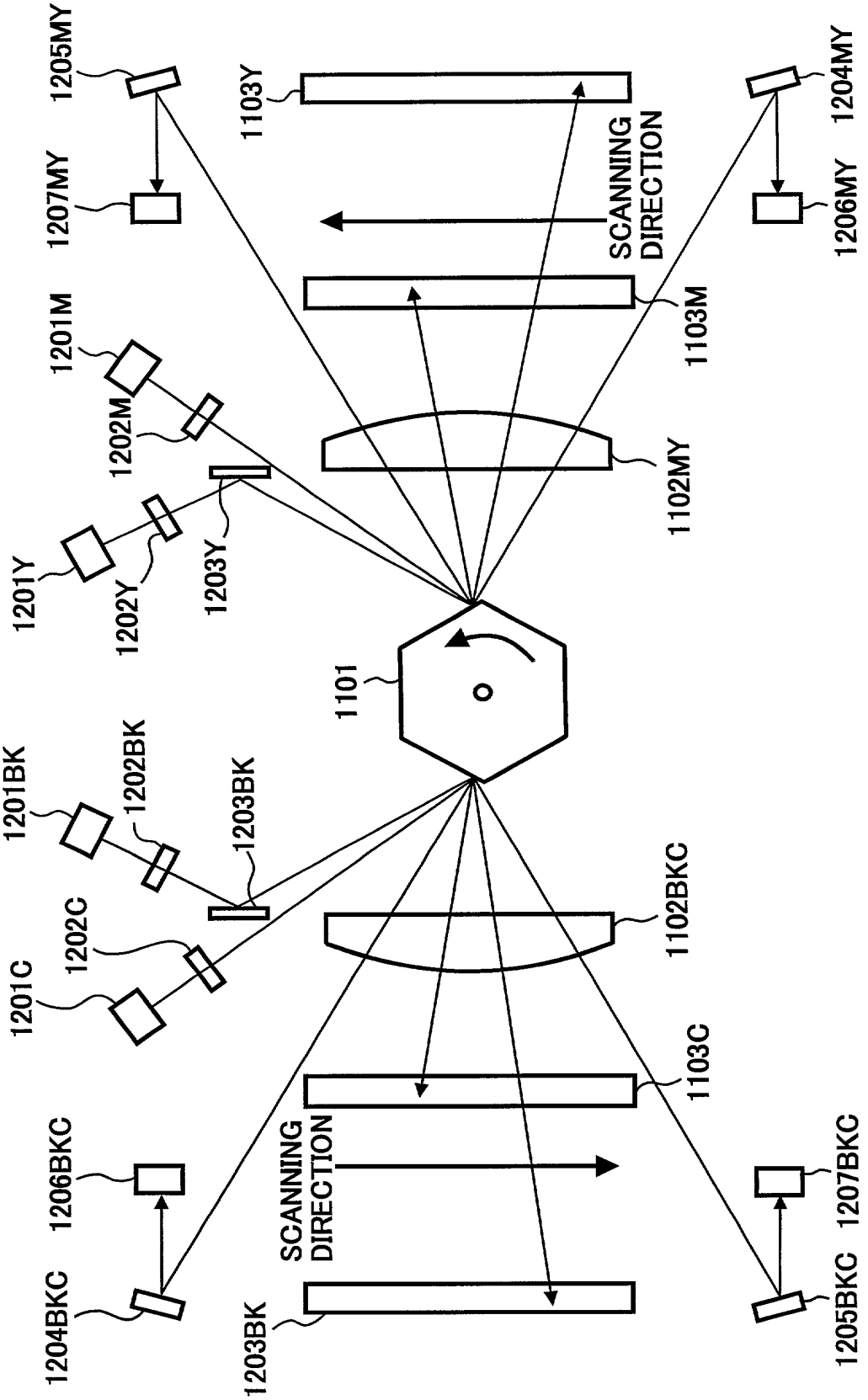

1205MY
1207MY
1103Y
1204MY
1206MY
SCANNING DIRECTION
1201M
1202M
1103M
1203Y
1102MY
1201Y
1202Y
1101
1201BK
1202BK
1203BK
1102BKC
1201C
1202C
1103C
SCANNING DIRECTION
1206BKC
1207BKC
1204BKC
1205BKC
1203BK

FIG. 13

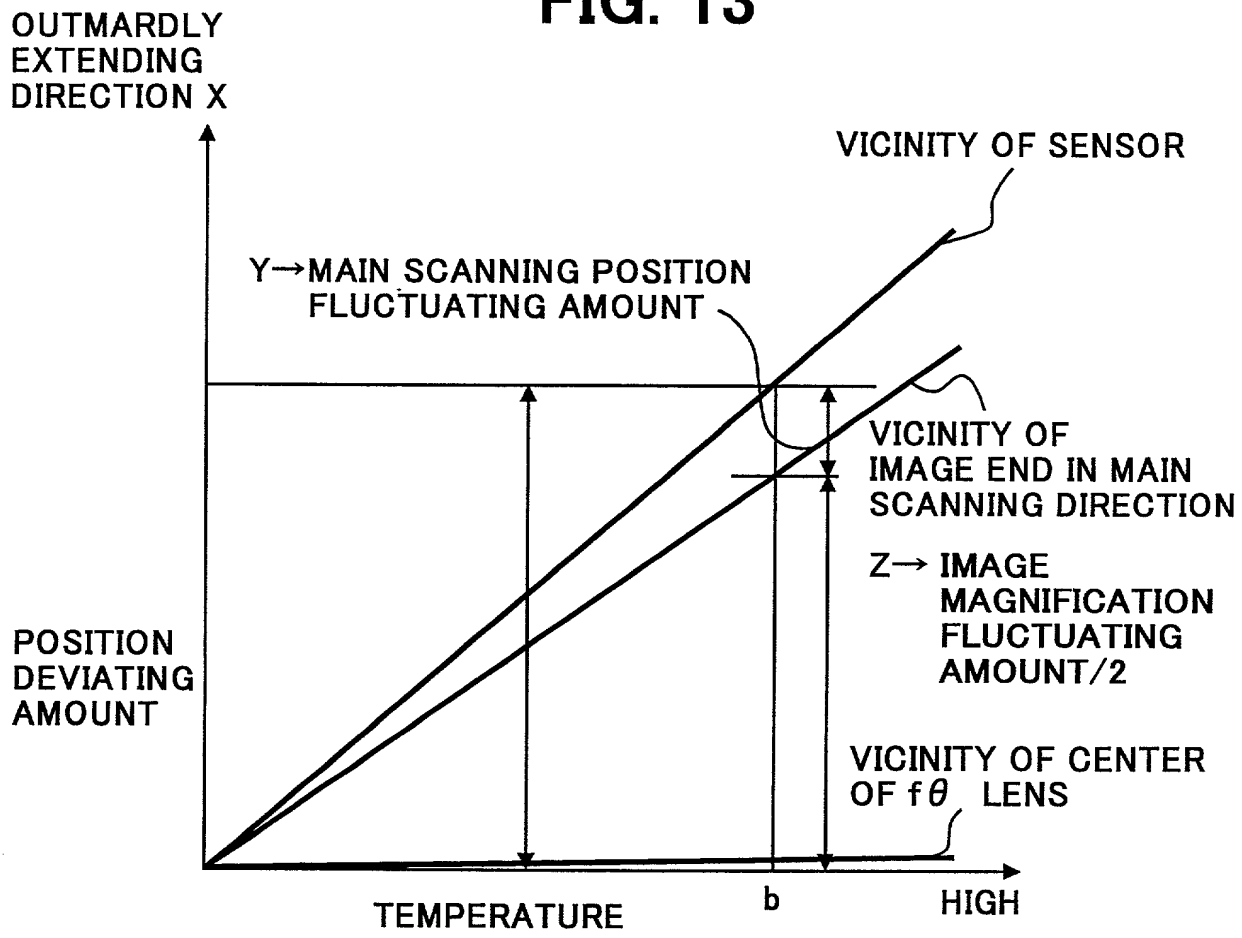

OUTMARDLY EXTENDING DIRECTION X
VICINITY OF SENSOR
Y→MAIN SCANNING POSITION FLUCTUATING AMOUNT
VICINITY OF IMAGE END IN MAIN SCANNING DIRECTION
Z→ IMAGE MAGNIFICATION FLUCTUATING AMOUNT/2
POSITION DEVIATING AMOUNT
VICINITY OF CENTER OF fθ LENS
TEMPERATURE
b
HIGH

FIG. 14

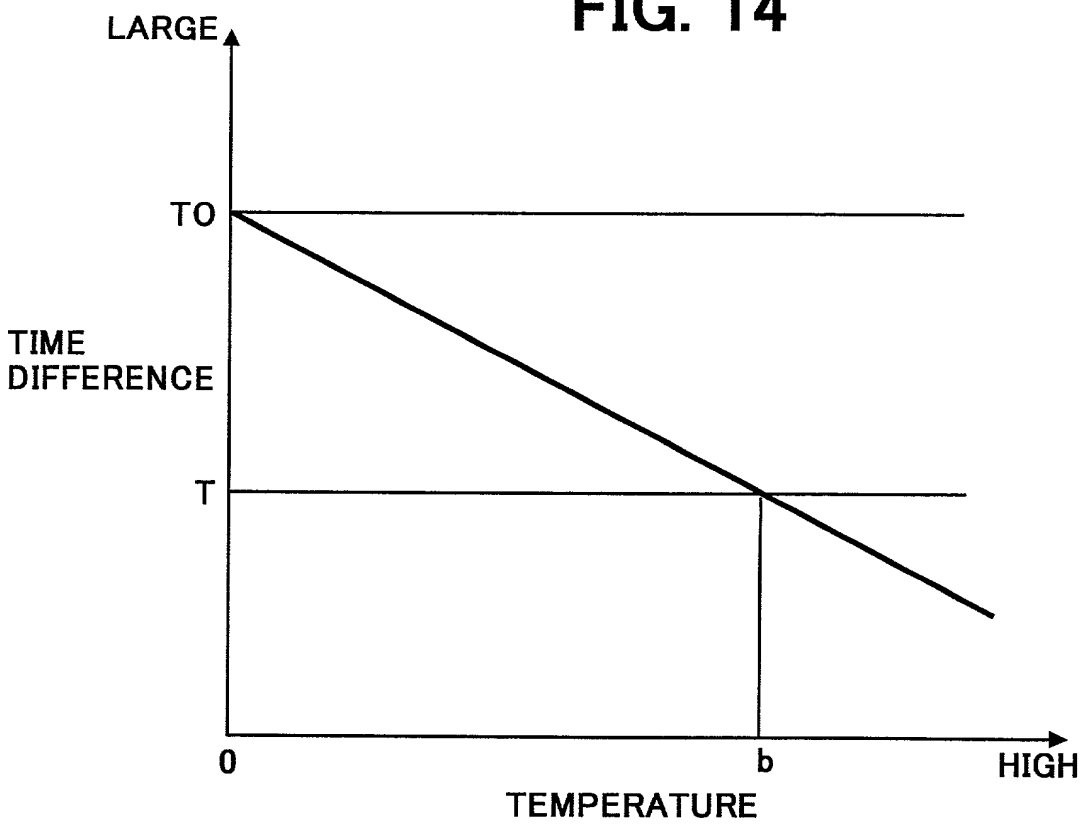


FIG. 15

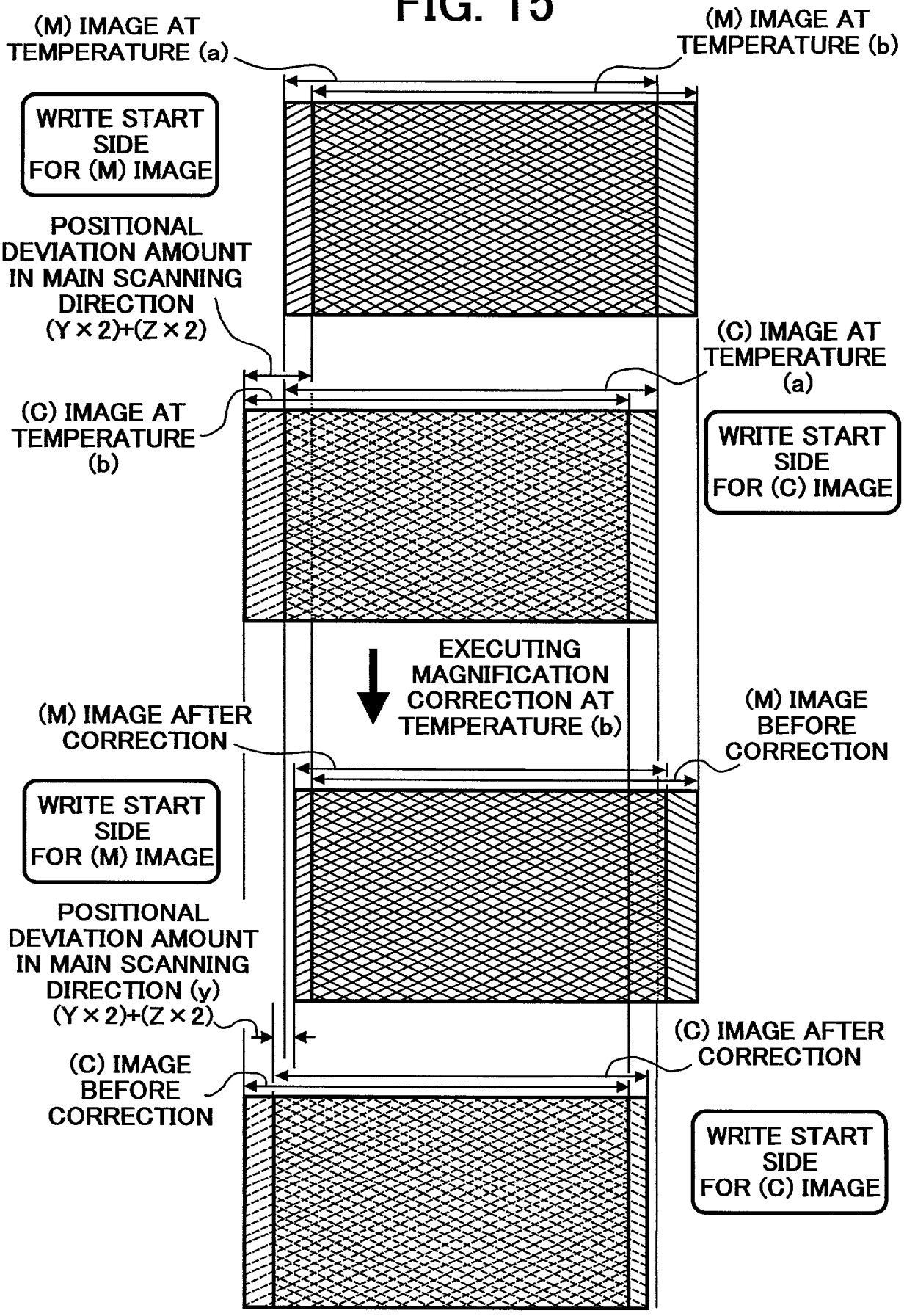

(M) IMAGE AT TEMPERATURE (a)
(M) IMAGE AT TEMPERATURE (b)
WRITE START SIDE FOR (M) IMAGE
POSITIONAL DEVIATION AMOUNT IN MAIN SCANNING DIRECTION (Y×2)+(Z×2)
(C) IMAGE AT TEMPERATURE (a)
(C) IMAGE AT TEMPERATURE (b)
WRITE START SIDE FOR (C) IMAGE
EXECUTING MAGNIFICATION CORRECTION AT TEMPERATURE (b)
(M) IMAGE AFTER CORRECTION
(M) IMAGE BEFORE CORRECTION
WRITE START SIDE FOR (M) IMAGE
POSITIONAL DEVIATION AMOUNT IN MAIN SCANNING DIRECTION (y) (Y×2)+(Z×2)
(C) IMAGE AFTER CORRECTION
(C) IMAGE BEFORE CORRECTION
WRITE START SIDE FOR (C) IMAGE

FIG. 16

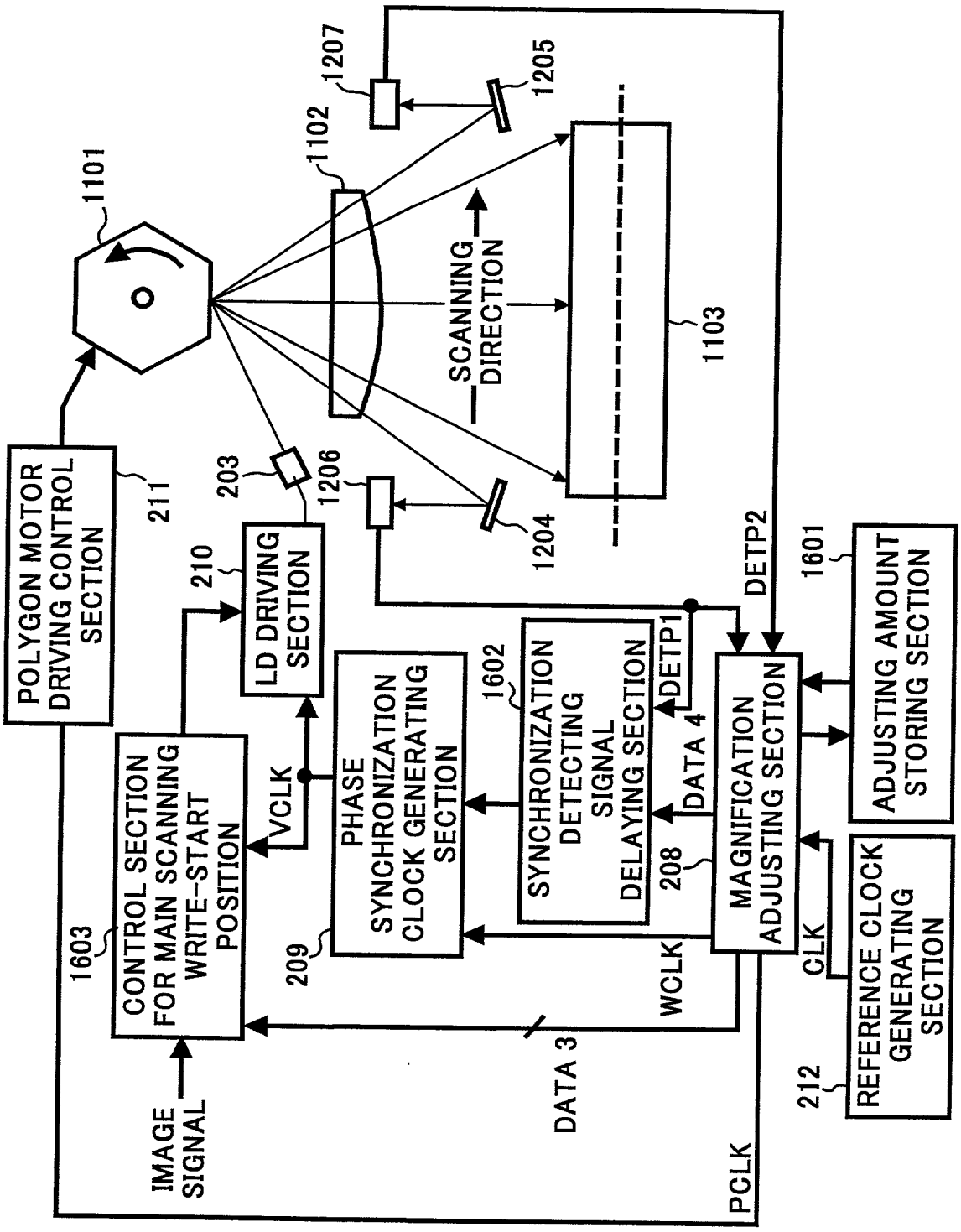

POLYGON MOTOR DRIVING CONTROL SECTION
211
LD DRIVING SECTION
210
203
1206
1204
1207
1205
1102
1101
SCANNING DIRECTION
1103
DETP2
1601
ADJUSTING AMOUNT STORING SECTION
1602
SYNCHRONIZATION DETECTING SIGNAL DELAYING SECTION
DETP1
DATA 4
208
MAGNIFICATION ADJUSTING SECTION
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION
VCLK
209
CONTROL SECTION FOR MAIN SCANNING WRITE-START POSITION
1603
IMAGE SIGNAL
DATA 3
WCLK
CLK
REFERENCE CLOCK GENERATING SECTION
212
PCLK

FIG. 17

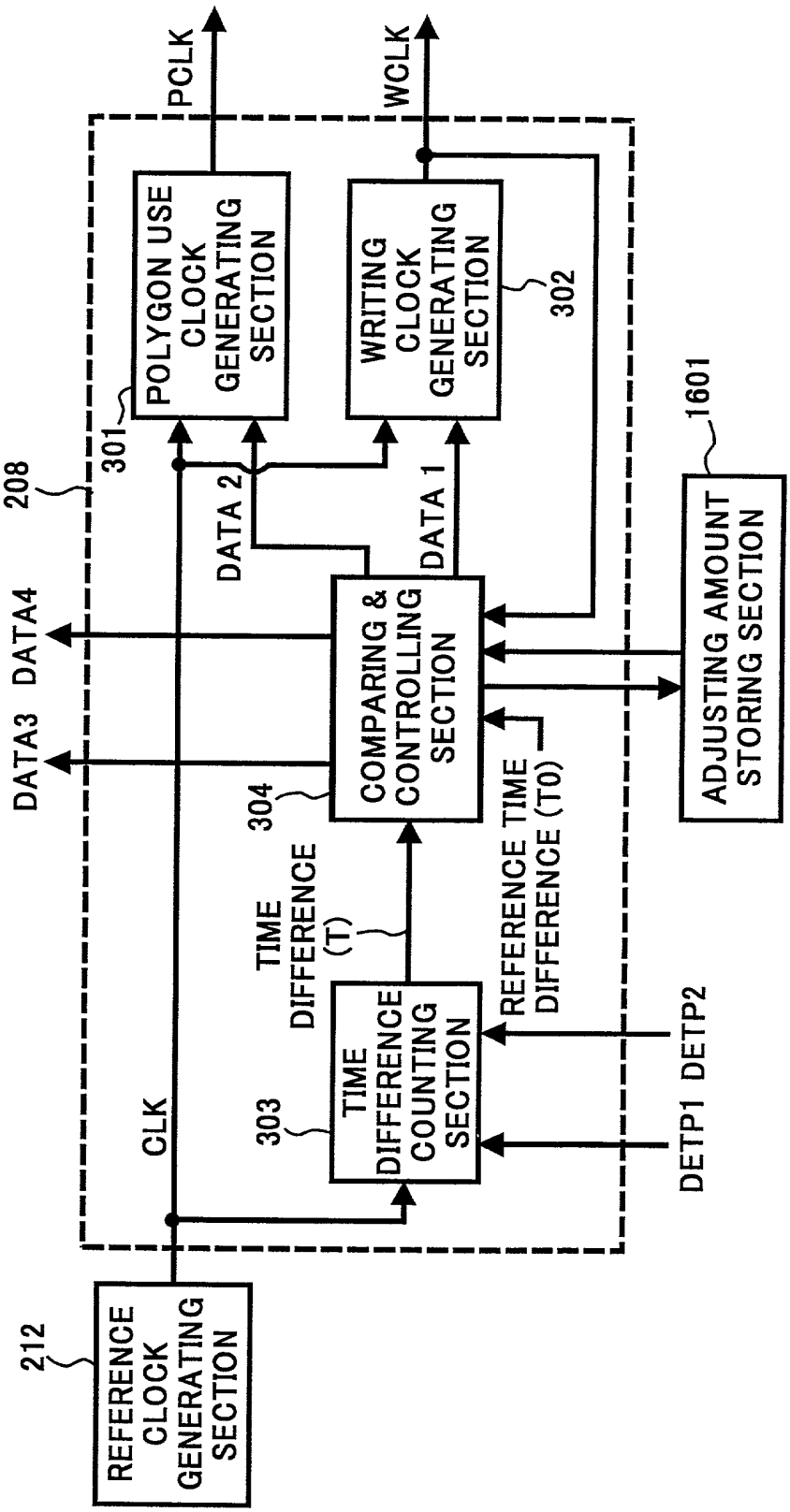

PCLK
WCLK
POLYGON USE CLOCK GENERATING SECTION
WRITING CLOCK GENERATING SECTION
302
301
208
1601
DATA 2
DATA 1
DATA4
DATA3
COMPARING & CONTROLLING SECTION
304
ADJUSTING AMOUNT STORING SECTION
TIME DIFFERENCE (T)
REFERENCE TIME DIFFERENCE (T0)
CLK
303
TIME DIFFERENCE COUNTING SECTION
DETP1
DETP2
212
REFERENCE CLOCK GENERATING SECTION

FIG. 18

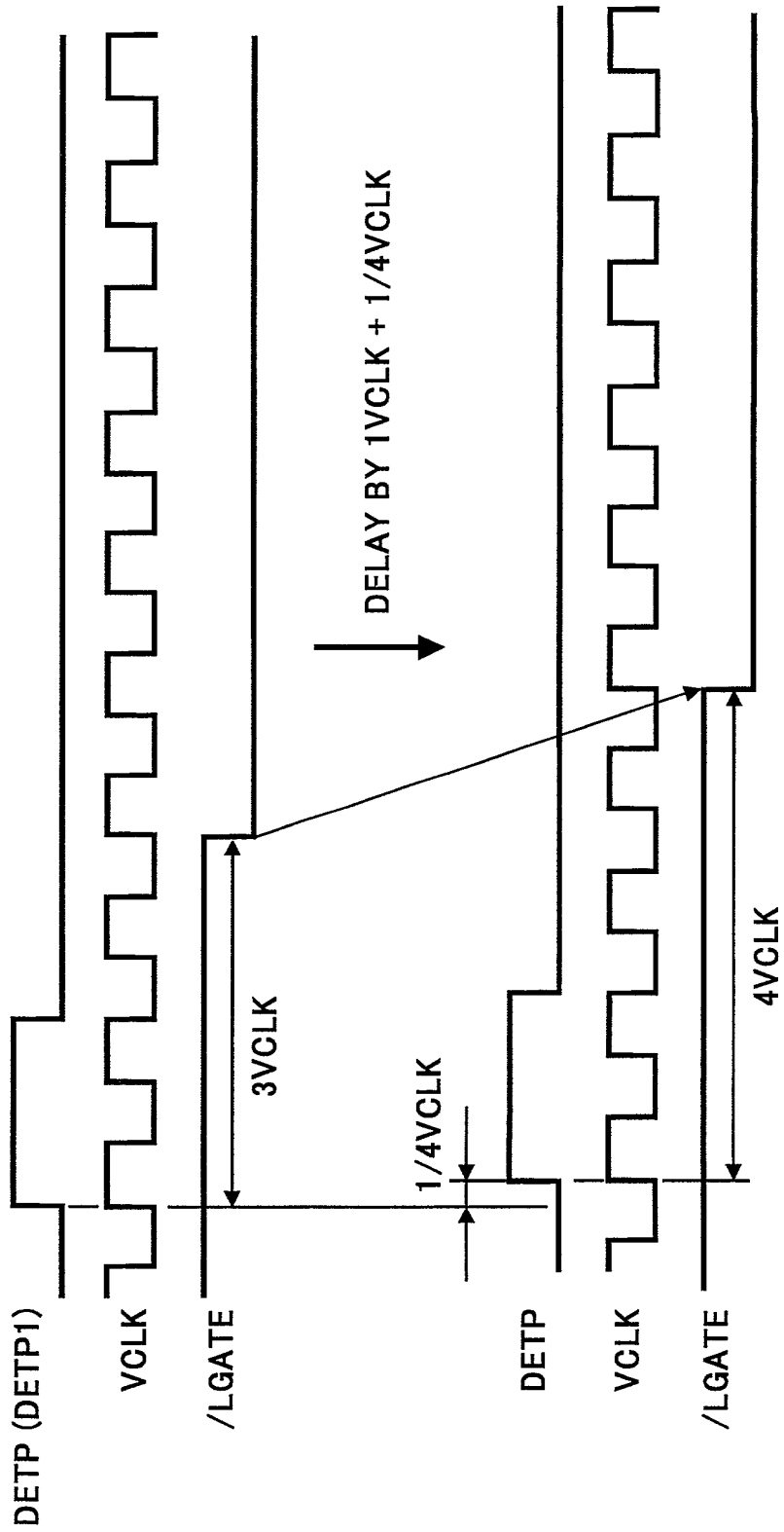

DETP (DETP1)
VCLK
/LGATE
3VCLK
DELAY BY 1VCLK + 1/4VCLK
1/4VCLK
DETP
VCLK
/LGATE
4VCLK

FIG. 19

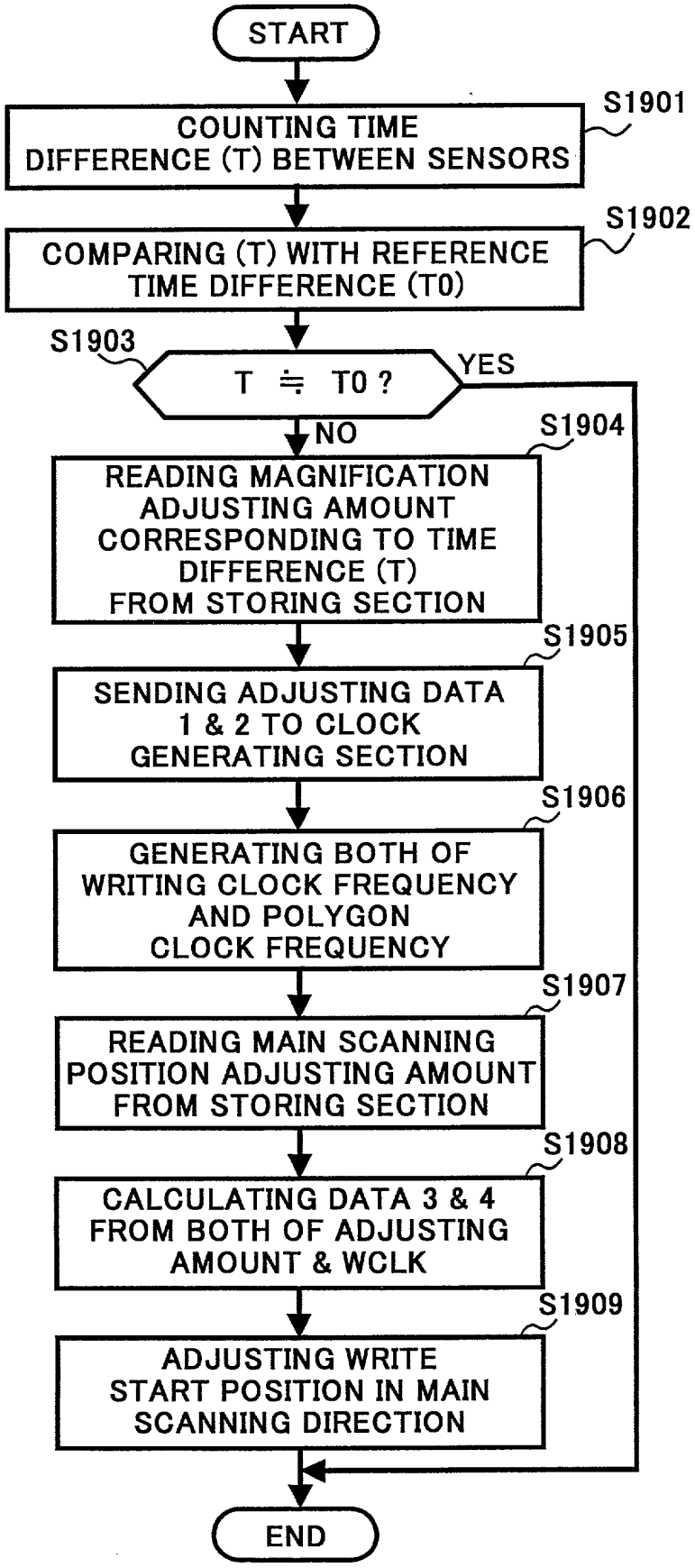

START
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S1901
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T0)
S1902
S1903
T ≒ T0 ?
YES
NO
READING MAGNIFICATION ADJUSTING AMOUNT CORRESPONDING TO TIME DIFFERENCE (T) FROM STORING SECTION
S1904
SENDING ADJUSTING DATA 1 & 2 TO CLOCK GENERATING SECTION
S1905
GENERATING BOTH OF WRITING CLOCK FREQUENCY AND POLYGON CLOCK FREQUENCY
S1906
READING MAIN SCANNING POSITION ADJUSTING AMOUNT FROM STORING SECTION
S1907
CALCULATING DATA 3 & 4 FROM BOTH OF ADJUSTING AMOUNT & WCLK
S1908
ADJUSTING WRITE START POSITION IN MAIN SCANNING DIRECTION
S1909
END

FIG. 20

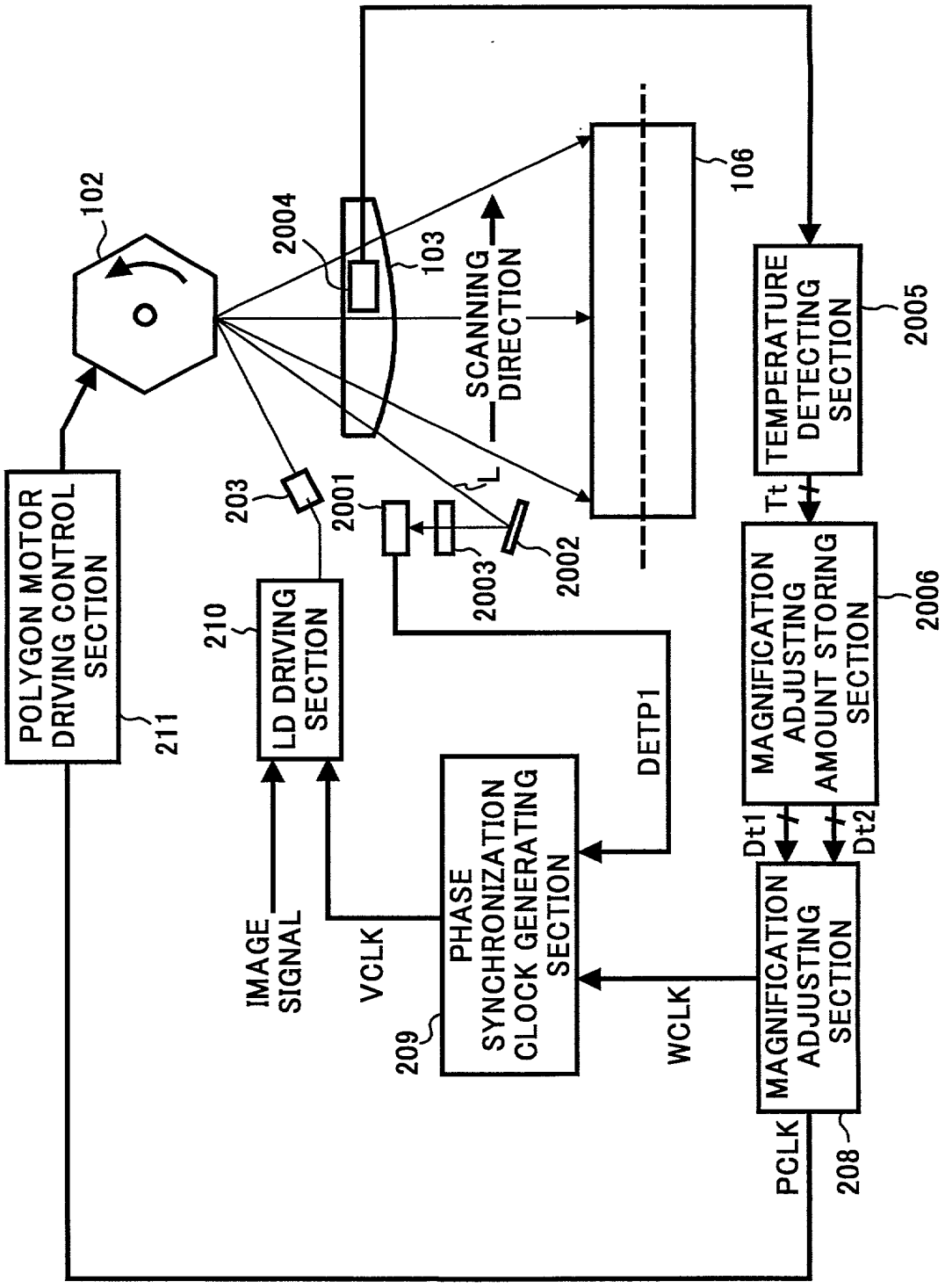

POLYGON MOTOR DRIVING CONTROL SECTION
211
102
2004
103
SCANNING DIRECTION
106
TEMPERATURE DETECTING SECTION
2005
203
2001
L
2003
2002
210
LD DRIVING SECTION
DETP1
Tt
MAGNIFICATION ADJUSTING AMOUNT STORING SECTION
2006
IMAGE SIGNAL
VCLK
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION
209
WCLK
Dt1
Dt2
MAGNIFICATION ADJUSTING SECTION
PCLK
208

FIG. 21

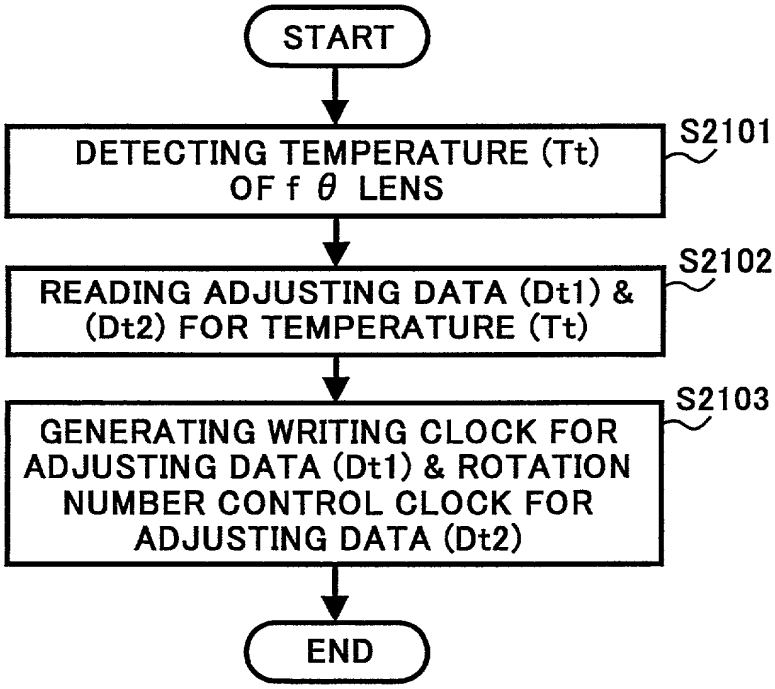

START
DETECTING TEMPERATURE (Tt) OF f θ LENS
S2101
READING ADJUSTING DATA (Dt1) & (Dt2) FOR TEMPERATURE (Tt)
S2102
GENERATING WRITING CLOCK FOR ADJUSTING DATA (Dt1) & ROTATION NUMBER CONTROL CLOCK FOR ADJUSTING DATA (Dt2)
S2103
END

FIG. 22

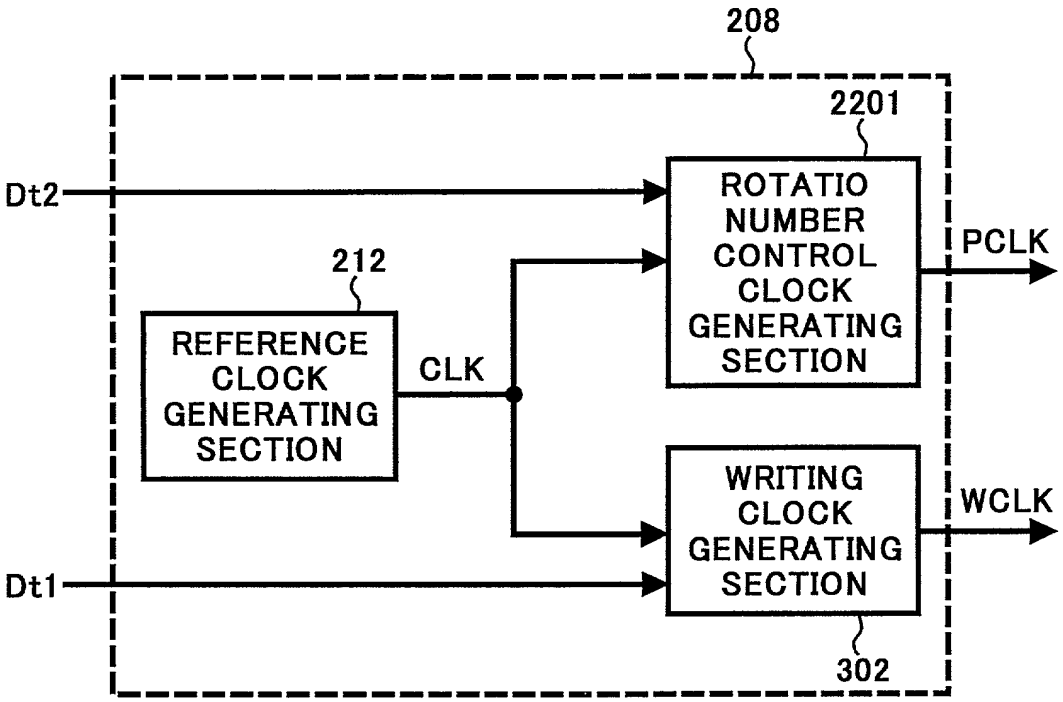

208
2201
Dt2
ROTATIO NUMBER CONTROL CLOCK GENERATING SECTION
PCLK
212
REFERENCE CLOCK GENERATING SECTION
CLK
WRITING CLOCK GENERATING SECTION
WCLK
Dt1
302

FIG. 23

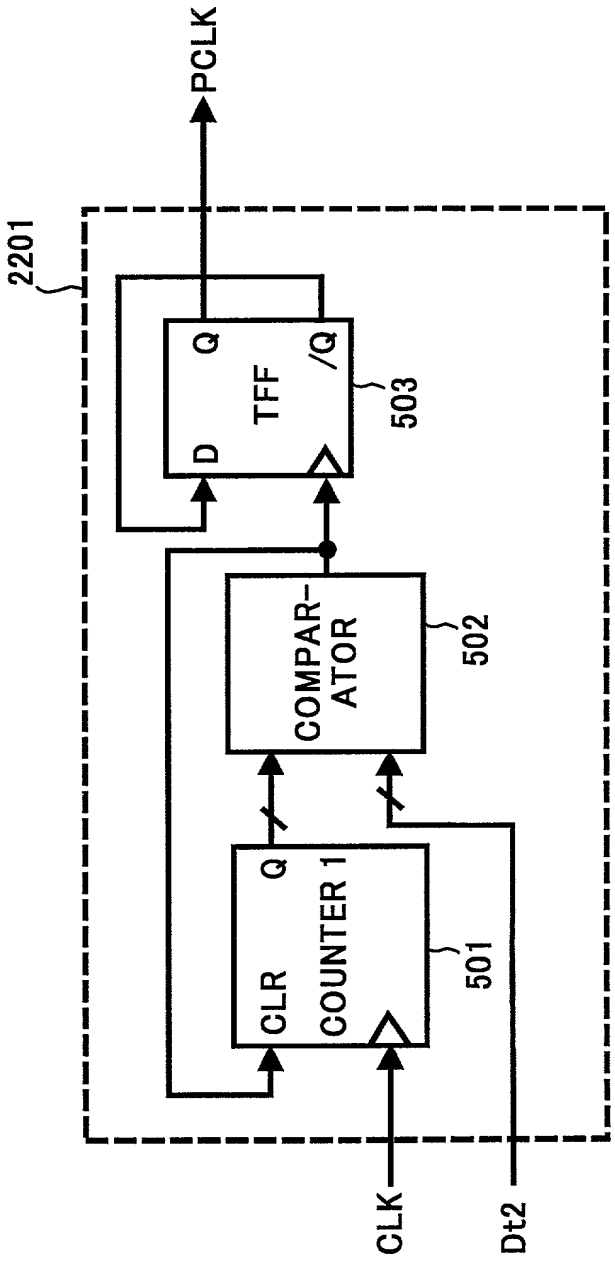

PCLK
2201
Q
/Q
TFF
D
503
COMPAR-
ATOR
502
Q
CLR
COUNTER 1
501
CLK
Dt2

FIG. 24

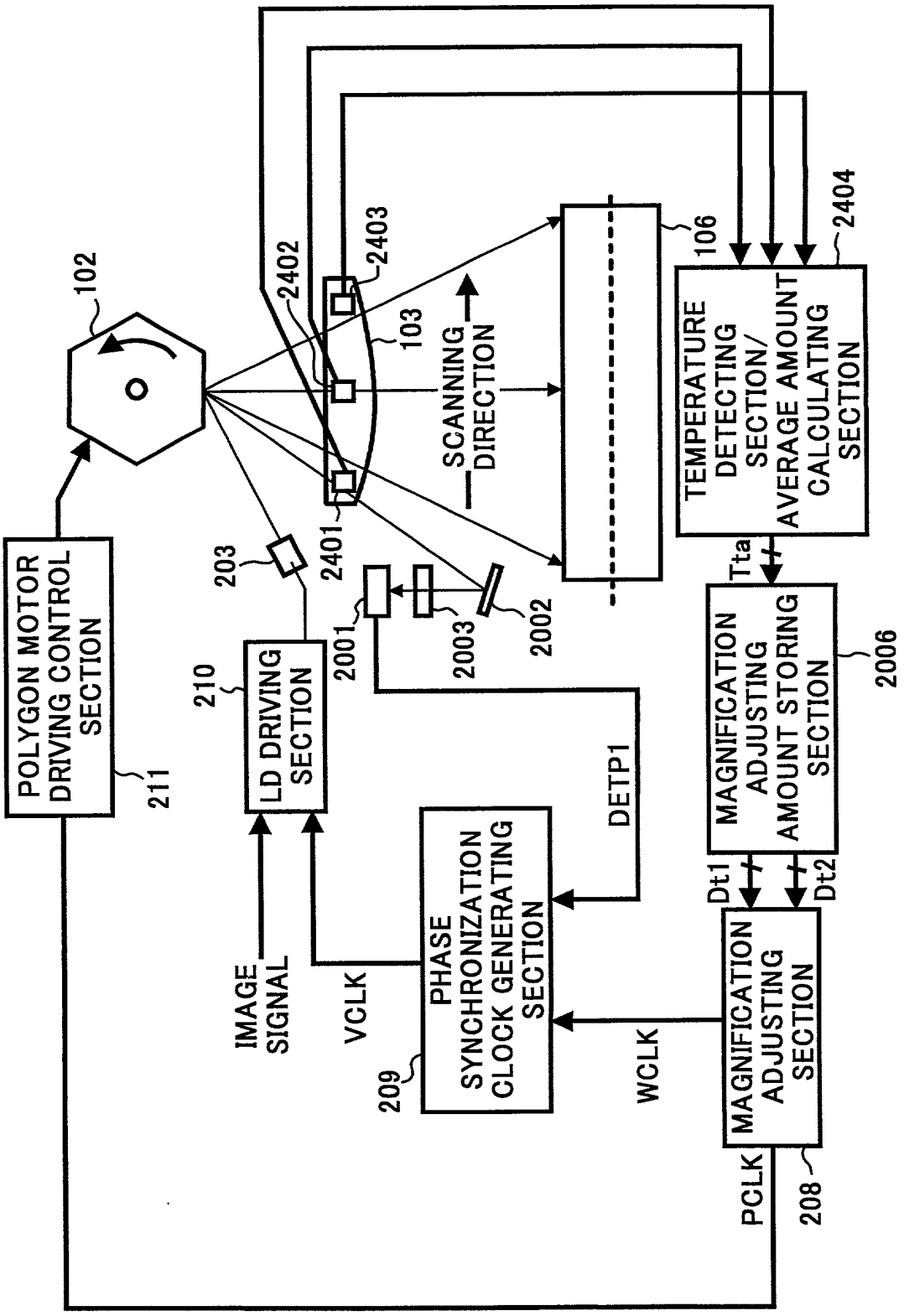

POLYGON MOTOR DRIVING CONTROL SECTION
211
102
LD DRIVING SECTION
210
203
2401
2001
2003
2002
2402
2403
103
SCANNING DIRECTION
106
TEMPERATURE DETECTING SECTION/ AVERAGE AMOUNT CALCULATING SECTION
2404
Tta
MAGNIFICATION ADJUSTING AMOUNT STORING SECTION
2006
DETP1
Dt1
Dt2
IMAGE SIGNAL
VCLK
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION
209
WCLK
MAGNIFICATION ADJUSTING SECTION
PCLK
208

FIG. 25

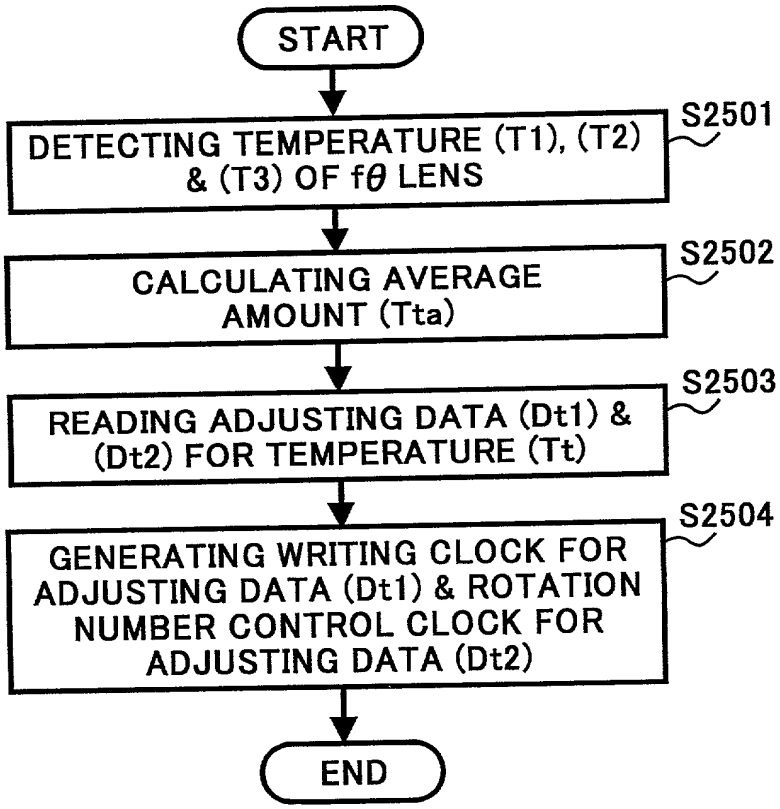

START
DETECTING TEMPERATURE (T1), (T2) & (T3) OF fθ LENS
S2501
CALCULATING AVERAGE AMOUNT (Tta)
S2502
READING ADJUSTING DATA (Dt1) & (Dt2) FOR TEMPERATURE (Tt)
S2503
GENERATING WRITING CLOCK FOR ADJUSTING DATA (Dt1) & ROTATION NUMBER CONTROL CLOCK FOR ADJUSTING DATA (Dt2)
S2504
END

FIG. 26

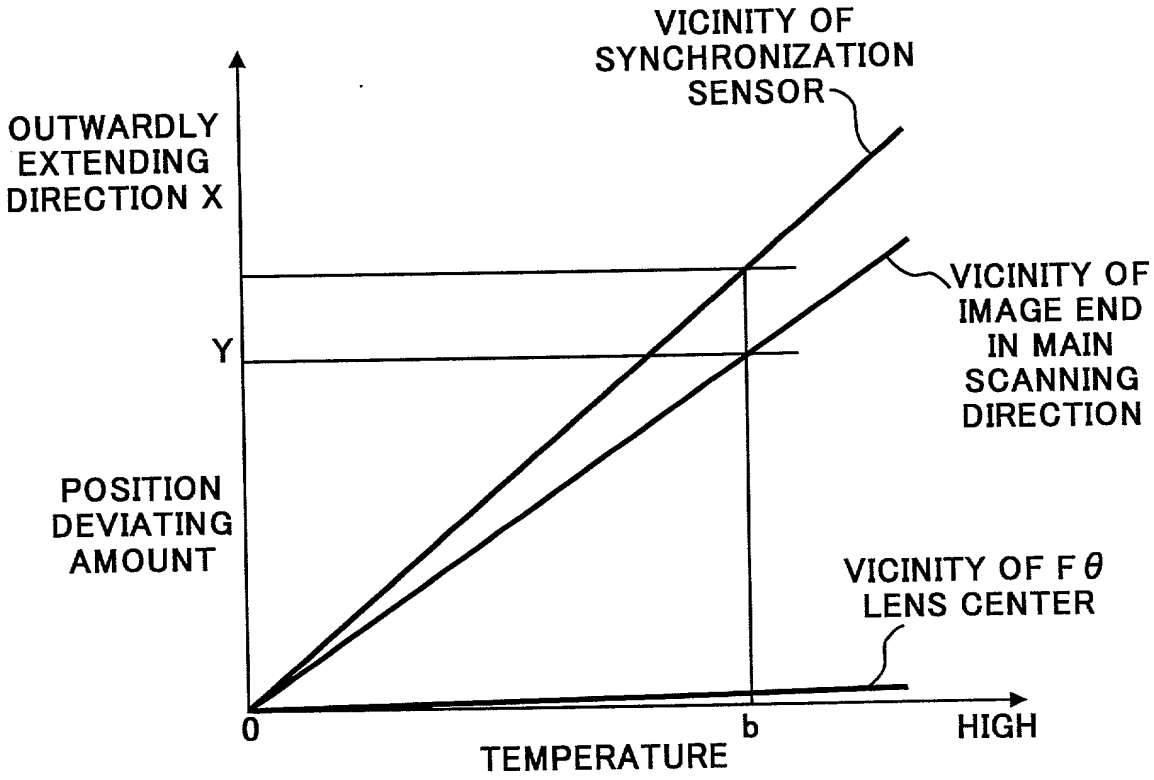

VICINITY OF SYNCHRONIZATION SENSOR
OUTWARDLY EXTENDING DIRECTION X
VICINITY OF IMAGE END IN MAIN SCANNING DIRECTION
Y
POSITION DEVIATING AMOUNT
VICINITY OF Fθ LENS CENTER
0
b
HIGH
TEMPERATURE

FIG. 27

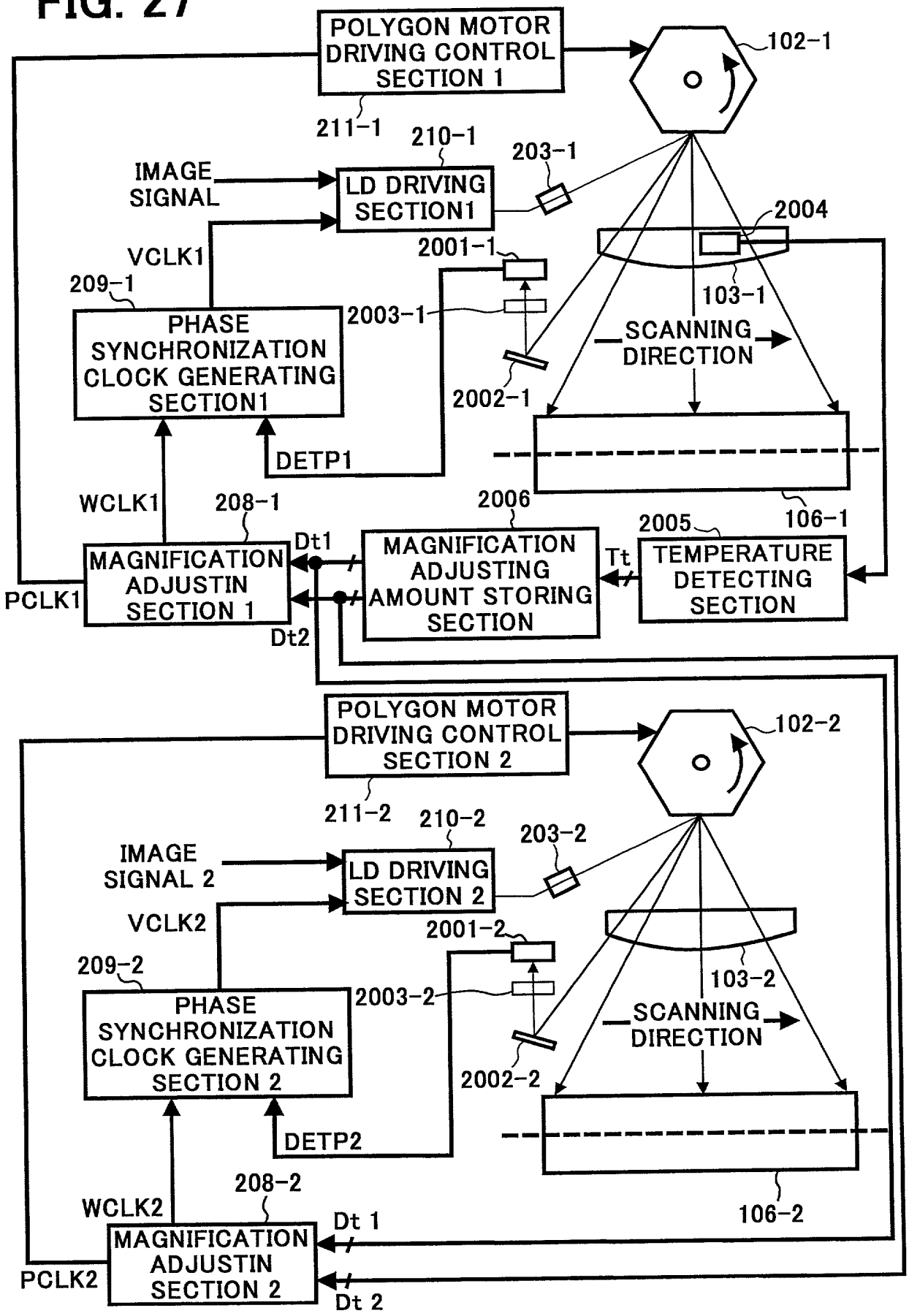

POLYGON MOTOR DRIVING CONTROL SECTION 1
102-1
211-1
210-1
203-1
IMAGE SIGNAL
LD DRIVING SECTION1
2004
2001-1
VCLK1
209-1
103-1
2003-1
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION1
SCANNING DIRECTION
2002-1
DETP1
WCLK1
208-1
2006
106-1
2005
Dt1
MAGNIFICATION ADJUSTIN SECTION 1
MAGNIFICATION ADJUSTING AMOUNT STORING SECTION
Tt
TEMPERATURE DETECTING SECTION
PCLK1
Dt2
POLYGON MOTOR DRIVING CONTROL SECTION 2
102-2
211-2
210-2
203-2
IMAGE SIGNAL 2
LD DRIVING SECTION 2
VCLK2
2001-2
209-2
103-2
2003-2
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION 2
SCANNING DIRECTION
2002-2
DETP2
208-2
WCLK2
Dt 1
106-2
MAGNIFICATION ADJUSTIN SECTION 2
PCLK2
Dt 2

FIG. 28

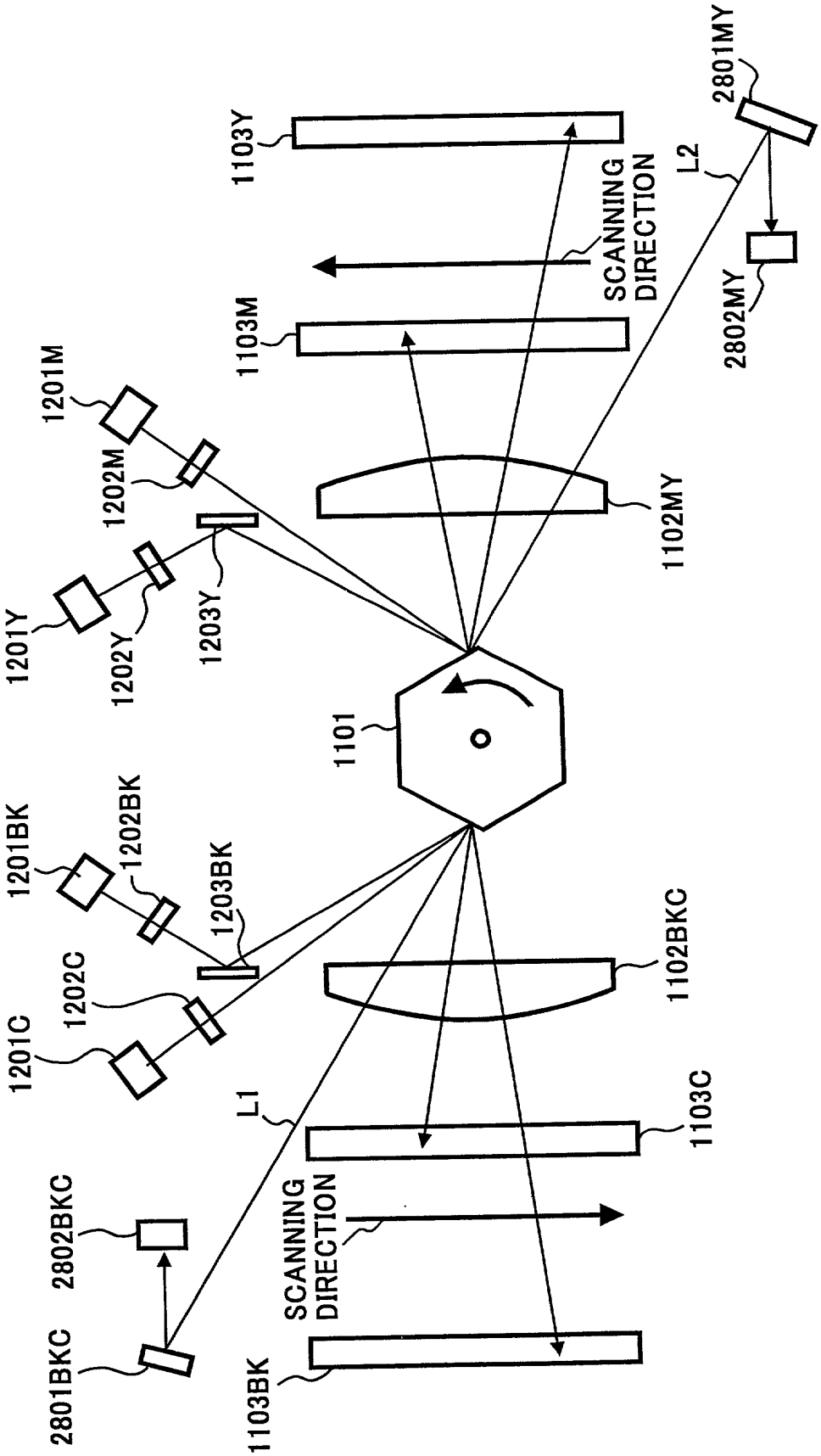

1103Y
2801MY
L2
SCANNING DIRECTION
1103M
2802MY
1201M
1202M
1102MY
1201Y
1202Y
1203Y
1101
1201BK
1202BK
1203BK
1102BKC
1201C
1202C
L1
1103C
SCANNING DIRECTION
2802BKC
2801BKC
1103BK

FIG. 29

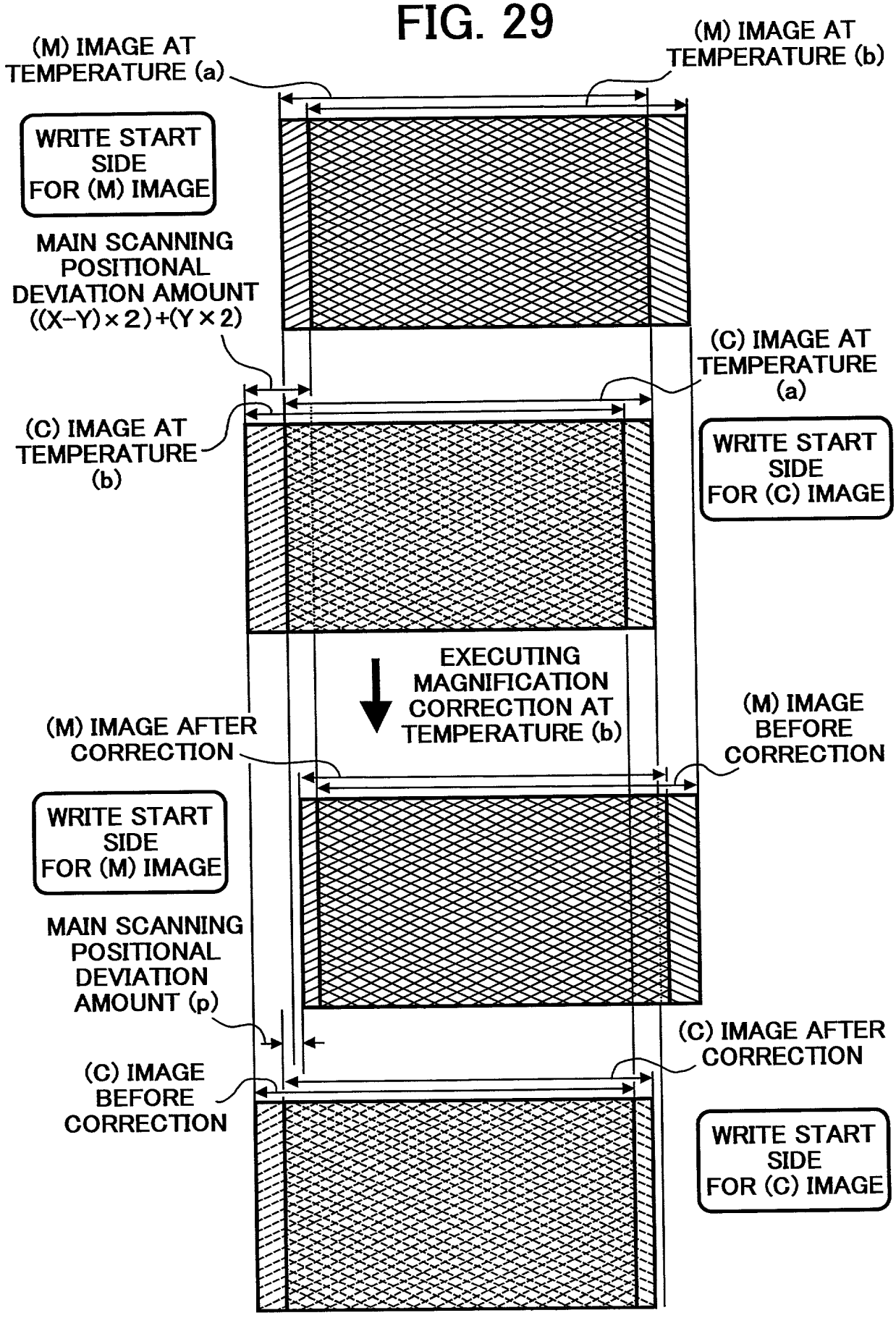

(M) IMAGE AT TEMPERATURE (a)
(M) IMAGE AT TEMPERATURE (b)
WRITE START SIDE FOR (M) IMAGE
MAIN SCANNING POSITIONAL DEVIATION AMOUNT ((X-Y)×2)+(Y×2)
(C) IMAGE AT TEMPERATURE (a)
(C) IMAGE AT TEMPERATURE (b)
WRITE START SIDE FOR (C) IMAGE
EXECUTING MAGNIFICATION CORRECTION AT TEMPERATURE (b)
(M) IMAGE AFTER CORRECTION
(M) IMAGE BEFORE CORRECTION
WRITE START SIDE FOR (M) IMAGE
MAIN SCANNING POSITIONAL DEVIATION AMOUNT (p)
(C) IMAGE AFTER CORRECTION
(C) IMAGE BEFORE CORRECTION
WRITE START SIDE FOR (C) IMAGE

FIG. 30

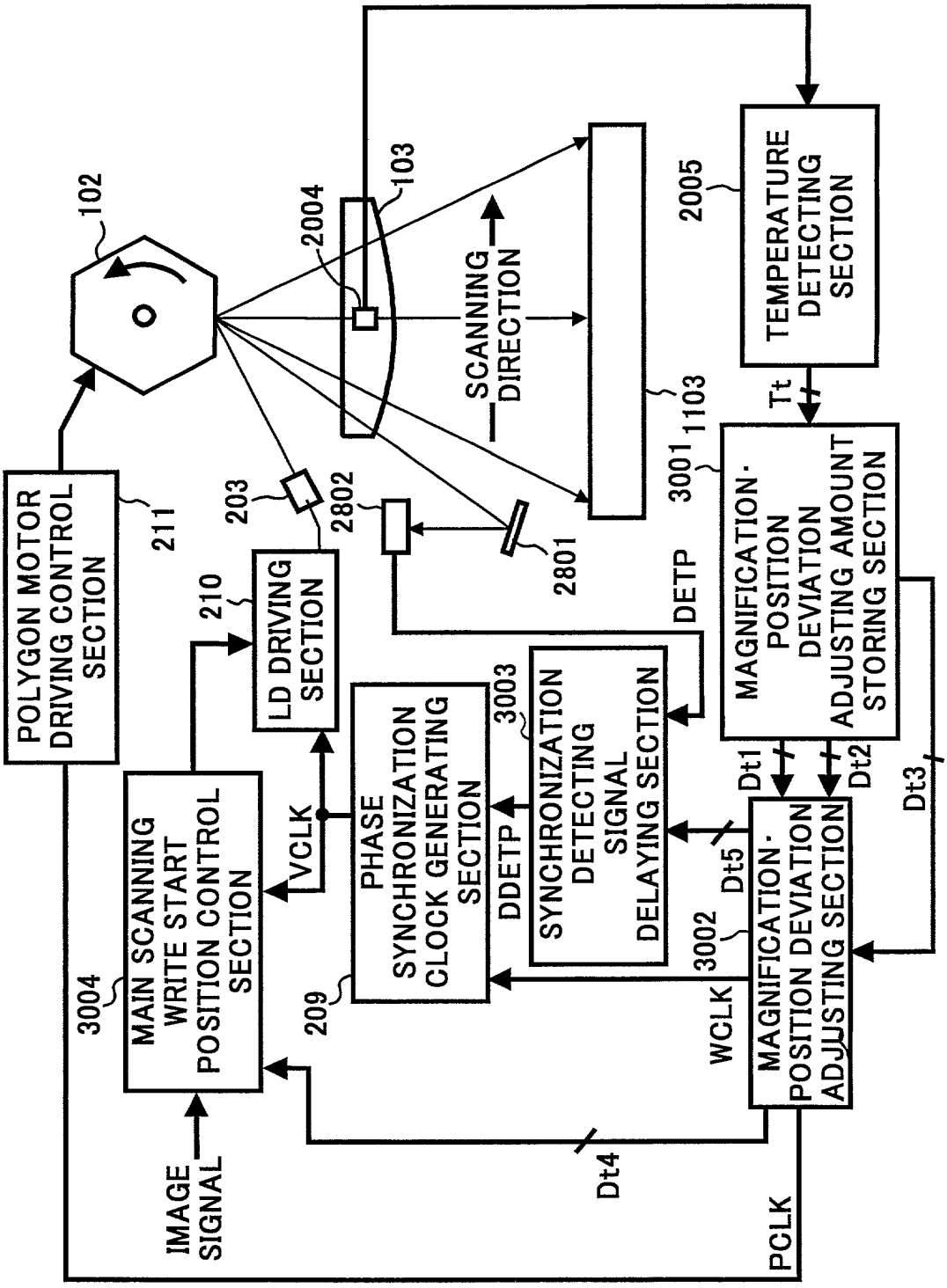

POLYGON MOTOR DRIVING CONTROL SECTION
211
102
2004
103
SCANNING DIRECTION
2005
TEMPERATURE DETECTING SECTION
Tt
203
2802
2801
1103
3001
MAGNIFICATION· POSITION DEVIATION ADJUSTING AMOUNT STORING SECTION
DETP
210
LD DRIVING SECTION
3003
SYNCHRONIZATION DETECTING SIGNAL DELAYING SECTION
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION
Dt1
Dt2
Dt3
3004
MAIN SCANNING WRITE START POSITION CONTROL SECTION
VCLK
DDETP
Dt5
3002
MAGNIFICATION· POSITION DEVIATION ADJUSTING SECTION
209
WCLK
IMAGE SIGNAL
Dt4
PCLK

FIG. 31

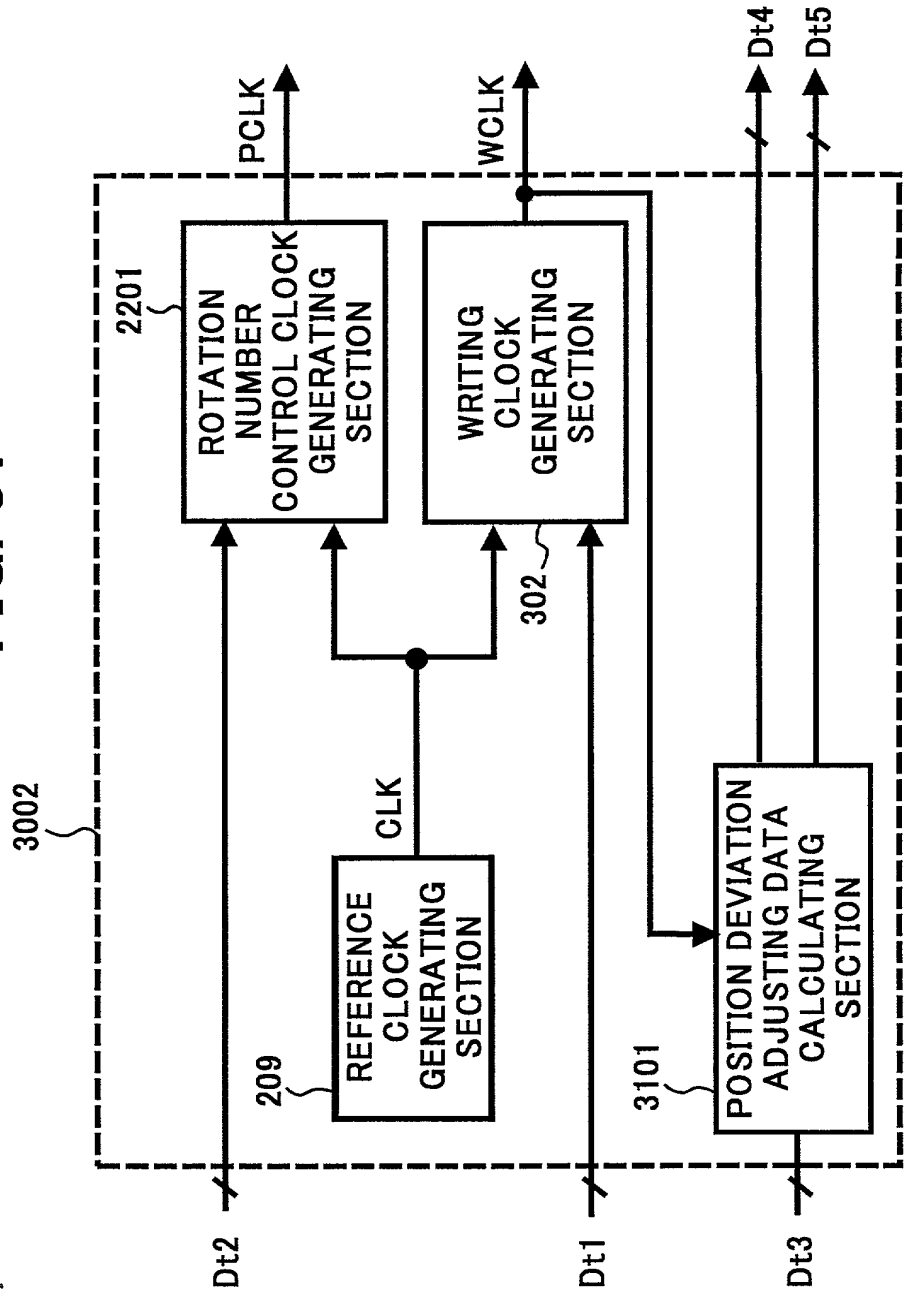

3002
2201
ROTATION NUMBER CONTROL CLOCK GENERATING SECTION
PCLK
WRITING CLOCK GENERATING SECTION
WCLK
302
Dt4
Dt5
CLK
209
REFERENCE CLOCK GENERATING SECTION
3101
POSITION DEVIATION ADJUSTING DATA CALCULATING SECTION
Dt2
Dt1
Dt3

FIG. 32

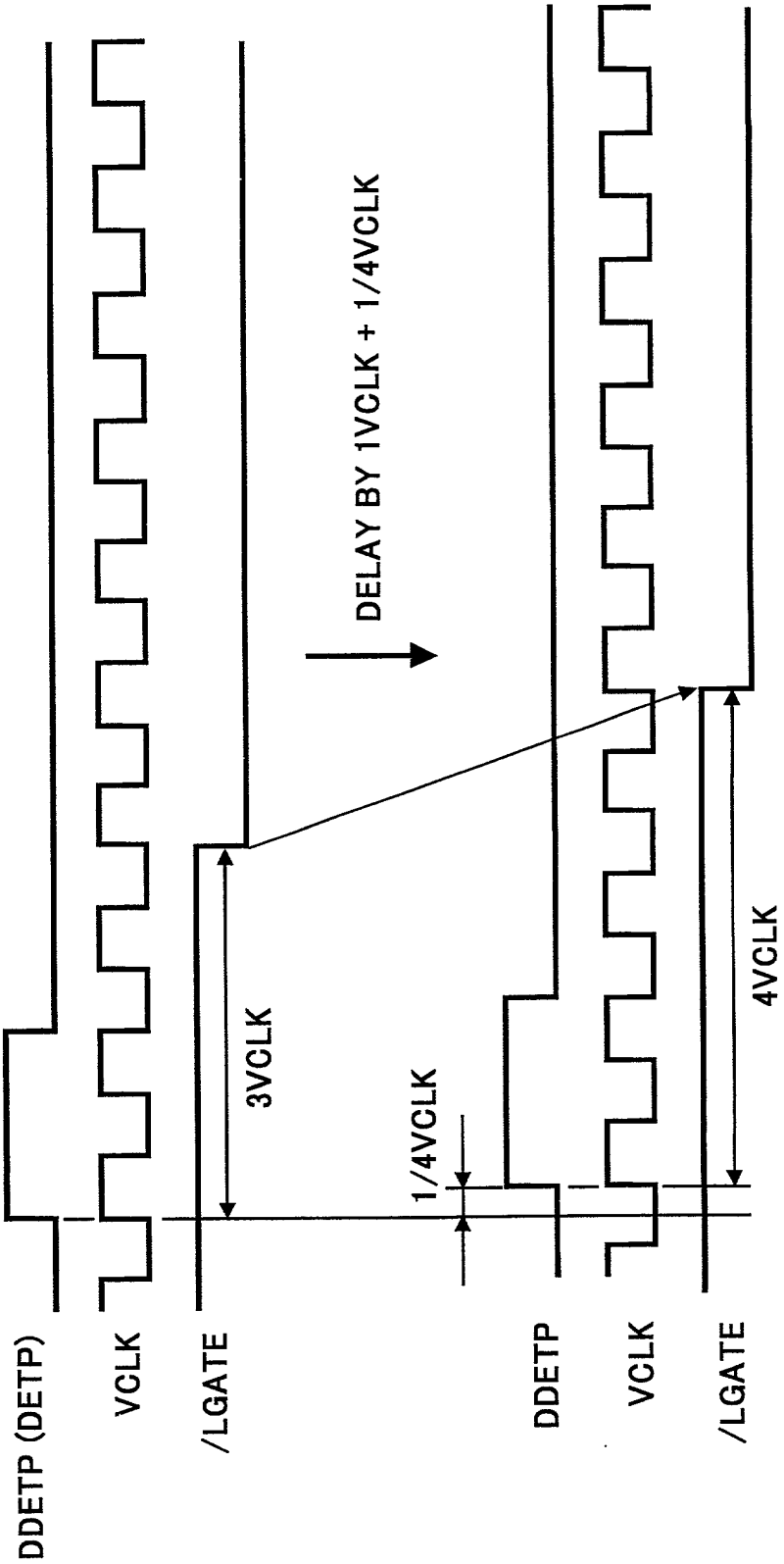

DDETP (DETP)
VCLK
/LGATE
3VCLK
DELAY BY 1VCLK + 1/4VCLK
1/4VCLK
4VCLK
DDETP
VCLK
/LGATE

FIG. 33

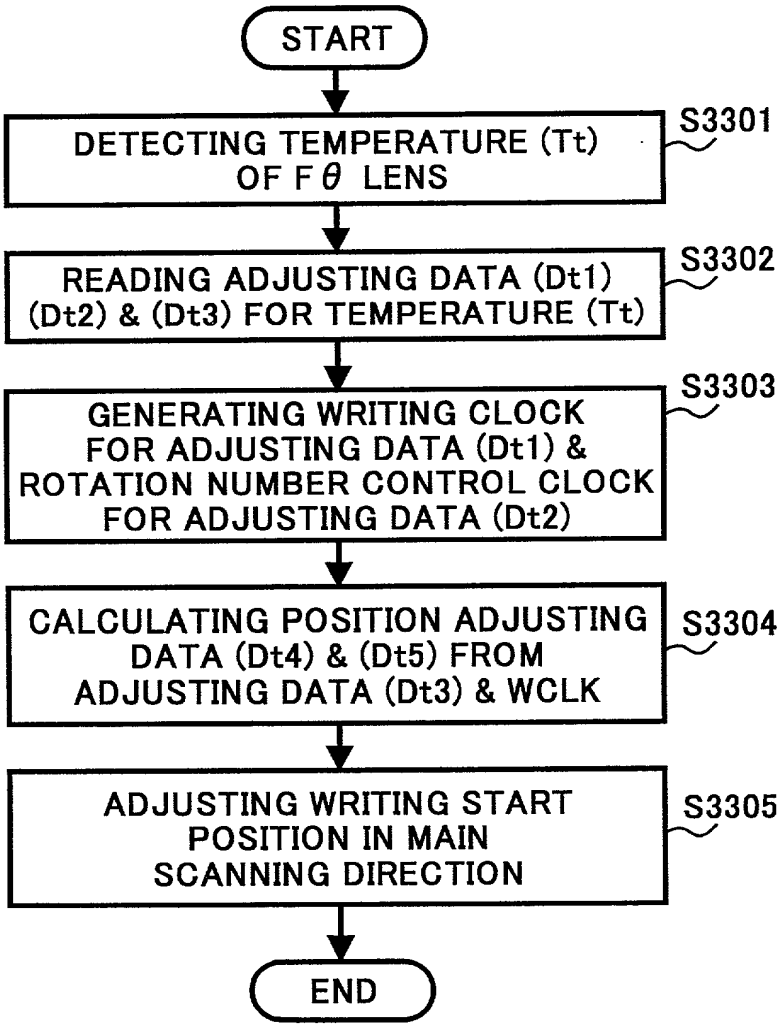

START
DETECTING TEMPERATURE (Tt) OF Fθ LENS
S3301
READING ADJUSTING DATA (Dt1) (Dt2) & (Dt3) FOR TEMPERATURE (Tt)
S3302
GENERATING WRITING CLOCK FOR ADJUSTING DATA (Dt1) & ROTATION NUMBER CONTROL CLOCK FOR ADJUSTING DATA (Dt2)
S3303
CALCULATING POSITION ADJUSTING DATA (Dt4) & (Dt5) FROM ADJUSTING DATA (Dt3) & WCLK
S3304
ADJUSTING WRITING START POSITION IN MAIN SCANNING DIRECTION
S3305
END

FIG. 34

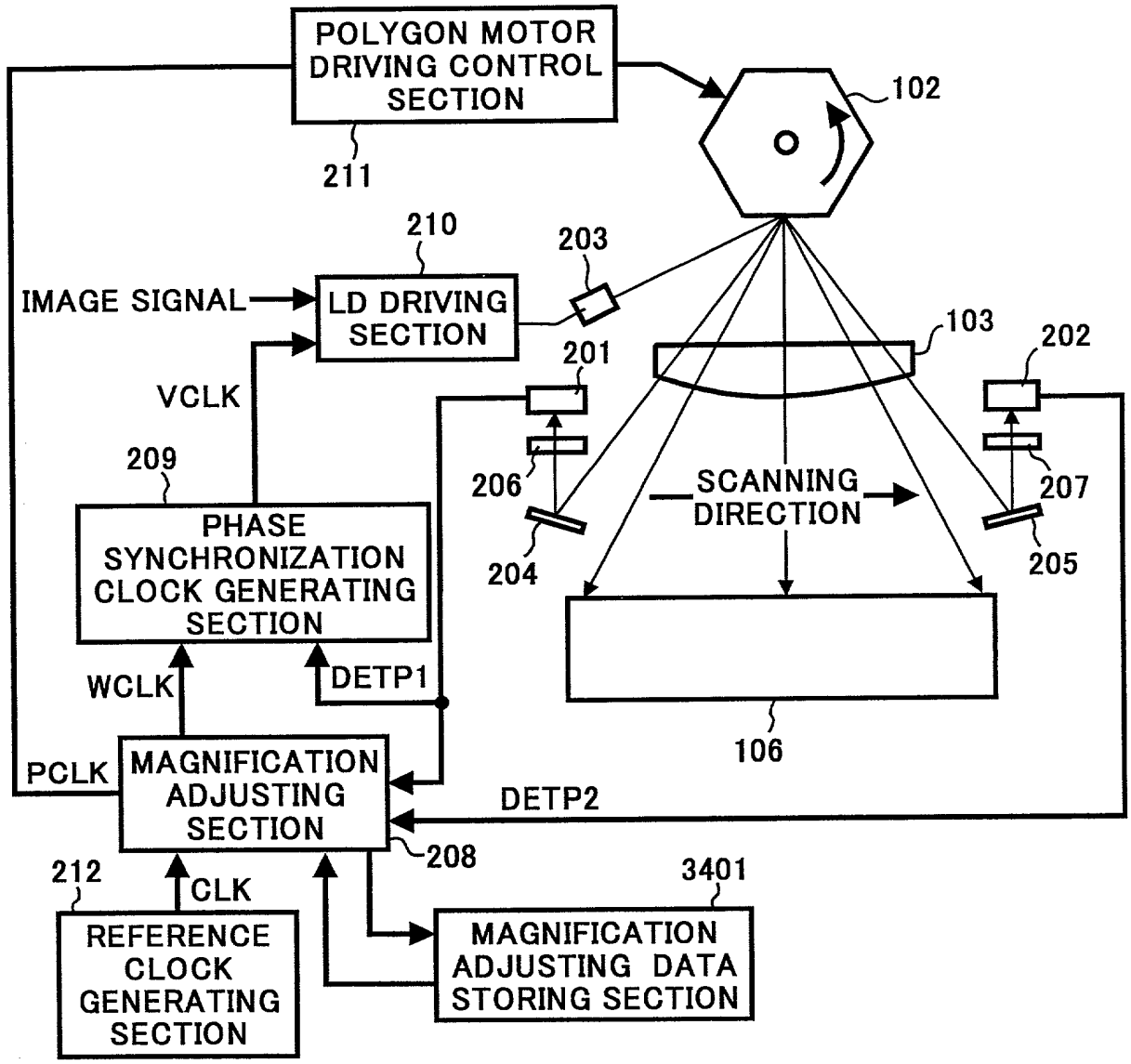

POLYGON MOTOR DRIVING CONTROL SECTION
211
102
210
203
IMAGE SIGNAL
LD DRIVING SECTION
103
202
201
VCLK
209
206
SCANNING DIRECTION
207
PHASE SYNCHRONIZATION CLOCK GENERATING SECTION
204
205
WCLK
DETP1
106
PCLK
MAGNIFICATION ADJUSTING SECTION
DETP2
208
212
CLK
3401
REFERENCE CLOCK GENERATING SECTION
MAGNIFICATION ADJUSTING DATA STORING SECTION

FIG. 35

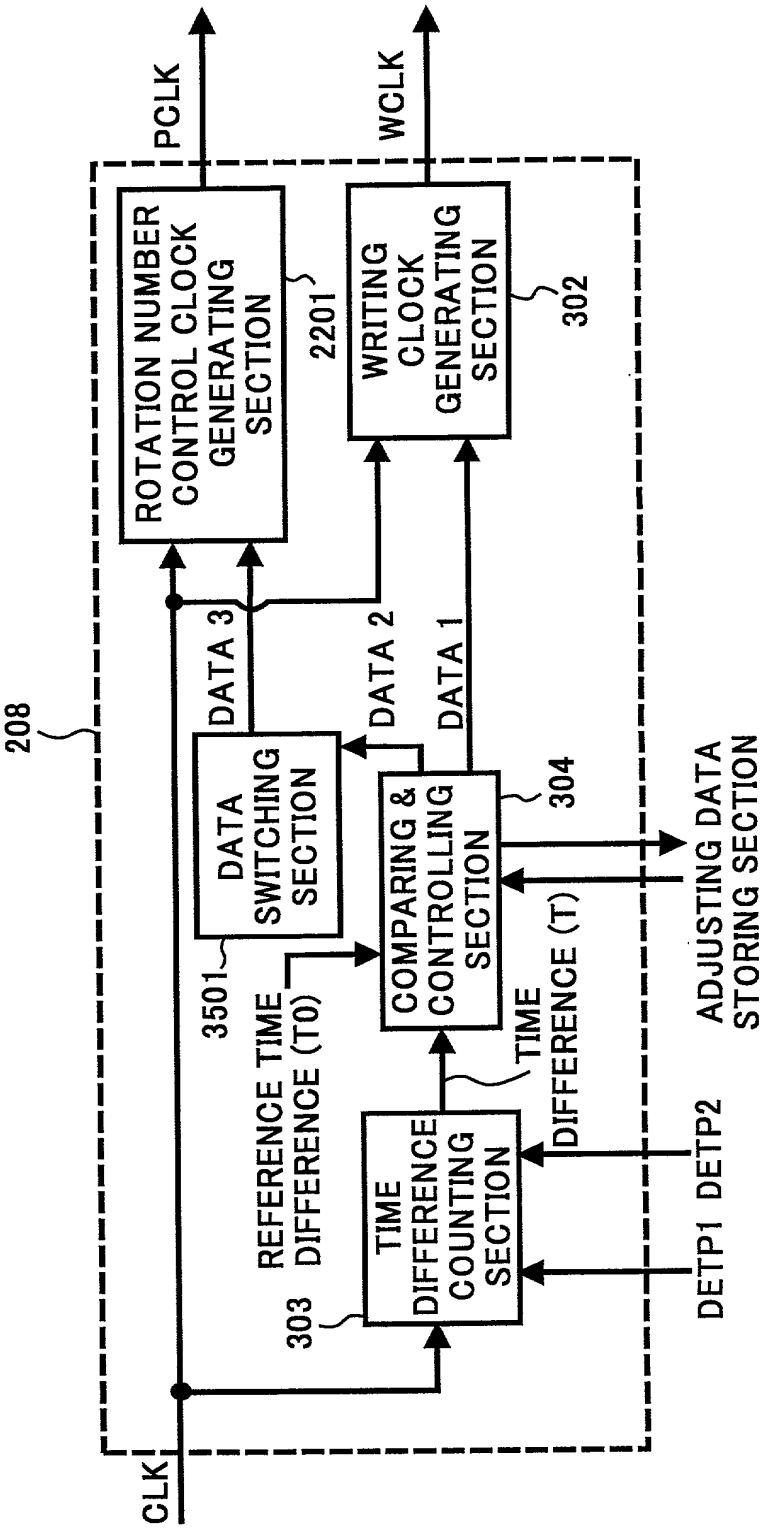

208
PCLK
WCLK
ROTATION NUMBER CONTROL CLOCK GENERATING SECTION
2201
WRITING CLOCK GENERATING SECTION
302
DATA 3
DATA 2
DATA 1
DATA SWITCHING SECTION
3501
COMPARING & CONTROLLING SECTION
304
REFERENCE TIME DIFFERENCE (T0)
TIME DIFFERENCE (T)
ADJUSTING DATA STORING SECTION
TIME DIFFERENCE COUNTING SECTION
303
DETP1 DETP2
CLK

FIG. 36

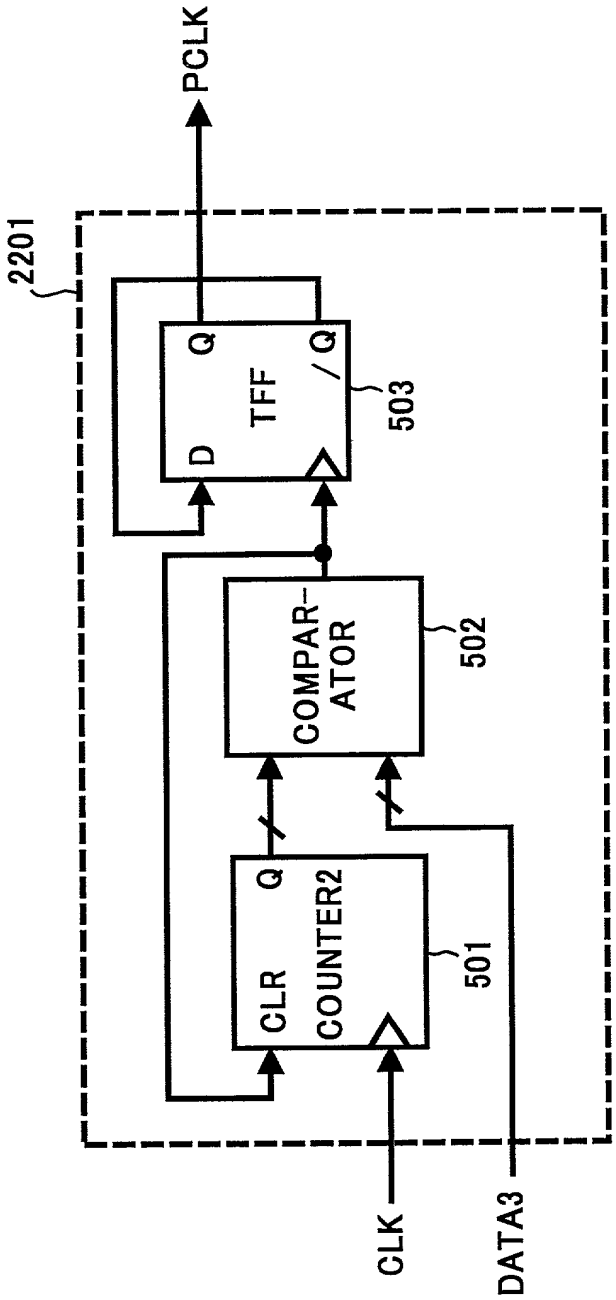

PCLK
2201
Q
/Q
D
TFF
503
COMPAR-
ATOR
502
Q
CLR
COUNTER2
501
CLK
DATA3

FIG.37

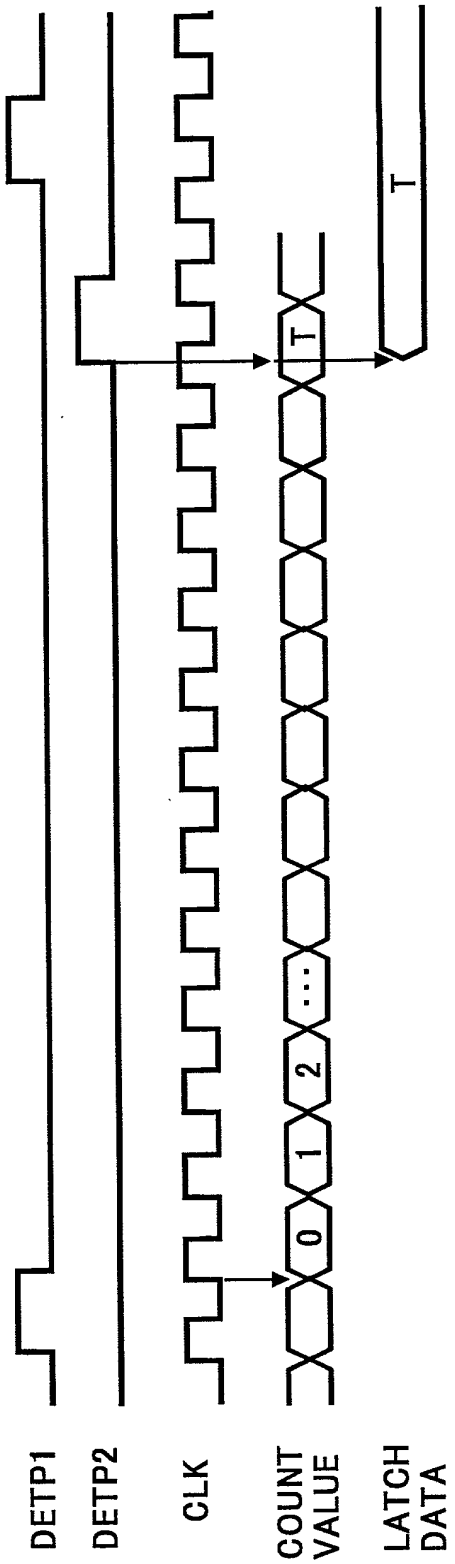


FIG. 38

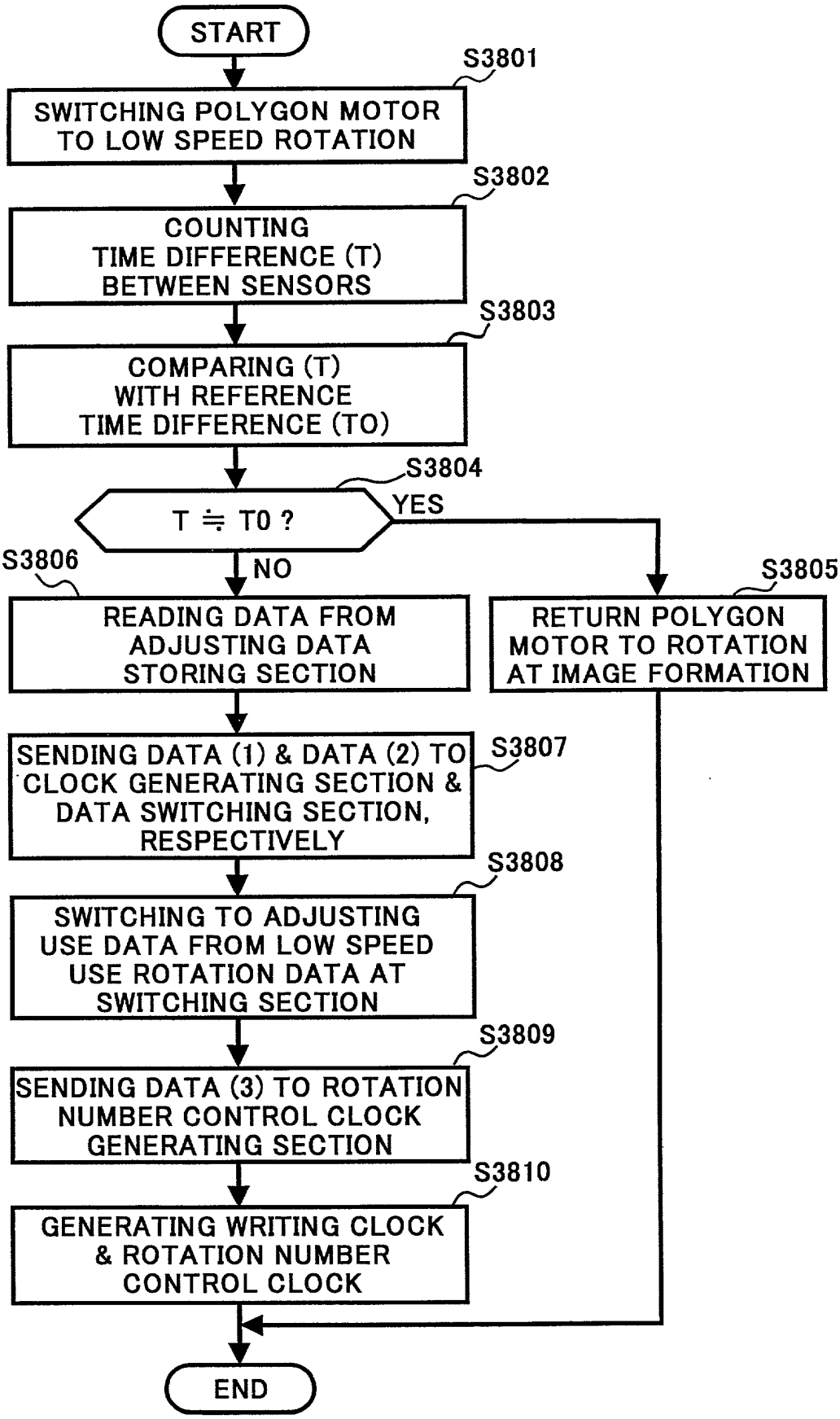

START
S3801
SWITCHING POLYGON MOTOR TO LOW SPEED ROTATION
S3802
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S3803
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (TO)
S3804
T ≒ T0 ?
YES
NO
S3806
READING DATA FROM ADJUSTING DATA STORING SECTION
S3805
RETURN POLYGON MOTOR TO ROTATION AT IMAGE FORMATION
SENDING DATA (1) & DATA (2) TO CLOCK GENERATING SECTION & DATA SWITCHING SECTION, RESPECTIVELY
S3807
S3808
SWITCHING TO ADJUSTING USE DATA FROM LOW SPEED USE ROTATION DATA AT SWITCHING SECTION
S3809
SENDING DATA (3) TO ROTATION NUMBER CONTROL CLOCK GENERATING SECTION
S3810
GENERATING WRITING CLOCK & ROTATION NUMBER CONTROL CLOCK
END

FIG. 39

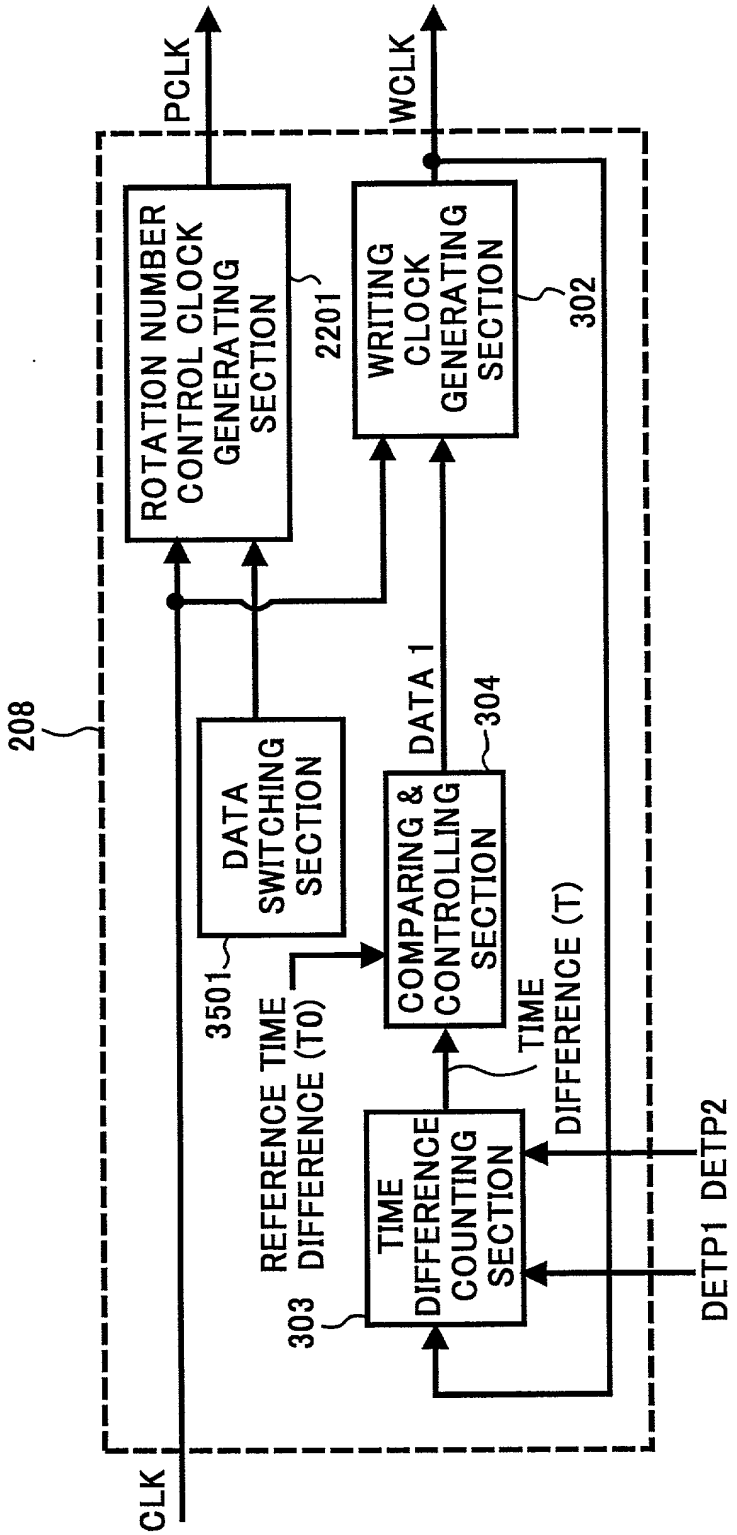

208
PCLK
WCLK
ROTATION NUMBER CONTROL CLOCK GENERATING SECTION
2201
WRITING CLOCK GENERATING SECTION
302
DATA SWITCHING SECTION
3501
DATA 1
304
COMPARING & CONTROLLING SECTION
REFERENCE TIME DIFFERENCE (T0)
TIME DIFFERENCE (T)
TIME DIFFERENCE COUNTING SECTION
303
DETP1
DETP2
CLK

FIG. 40

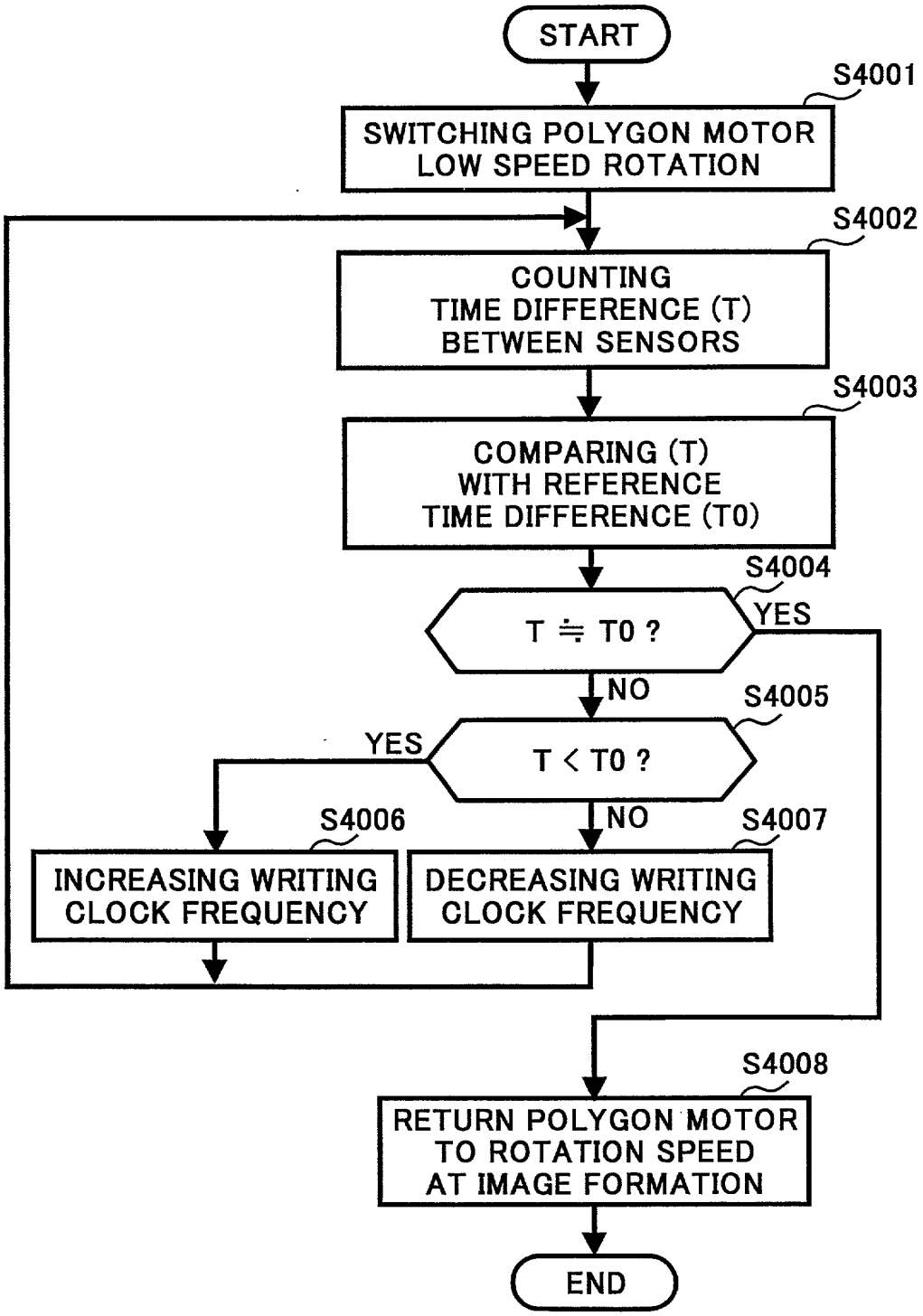

START
S4001
SWITCHING POLYGON MOTOR LOW SPEED ROTATION
S4002
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S4003
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T0)
S4004
T ≒ T0 ?
YES
NO
S4005
T < T0 ?
YES
NO
S4006
INCREASING WRITING CLOCK FREQUENCY
S4007
DECREASING WRITING CLOCK FREQUENCY
S4008
RETURN POLYGON MOTOR TO ROTATION SPEED AT IMAGE FORMATION
END

FIG. 41

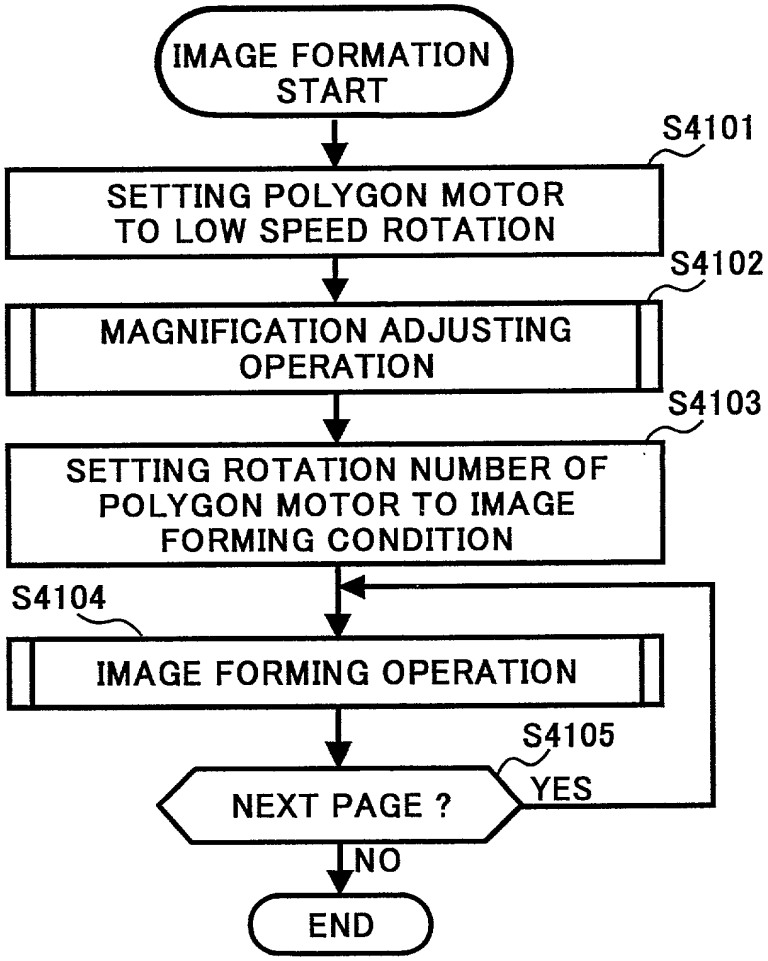


IMAGE FORMATION START
S4101
SETTING POLYGON MOTOR TO LOW SPEED ROTATION
S4102
MAGNIFICATION ADJUSTING OPERATION
S4103
SETTING ROTATION NUMBER OF POLYGON MOTOR TO IMAGE FORMING CONDITION
S4104
IMAGE FORMING OPERATION
S4105
NEXT PAGE ?
YES
NO
END

FIG. 42

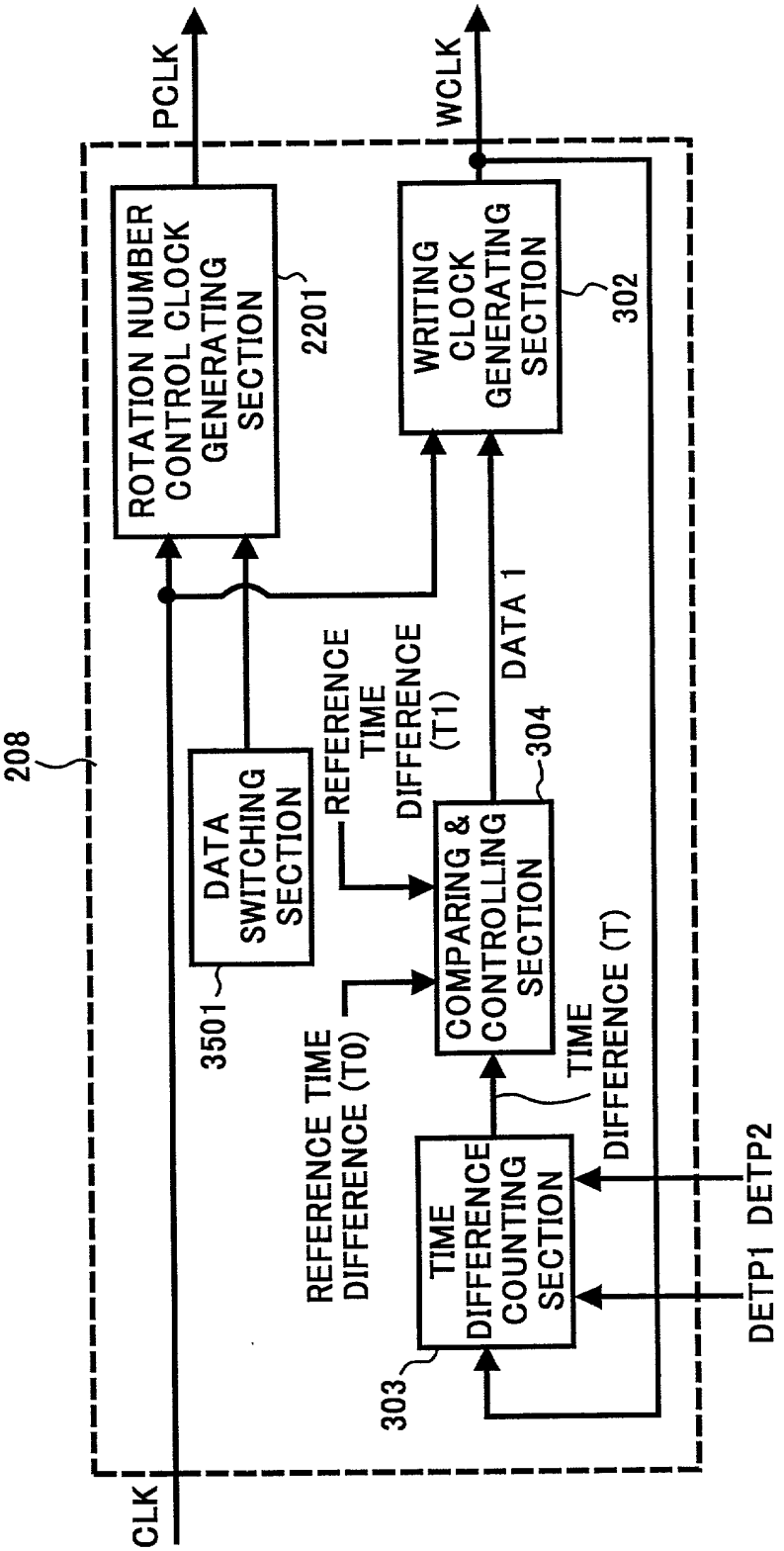
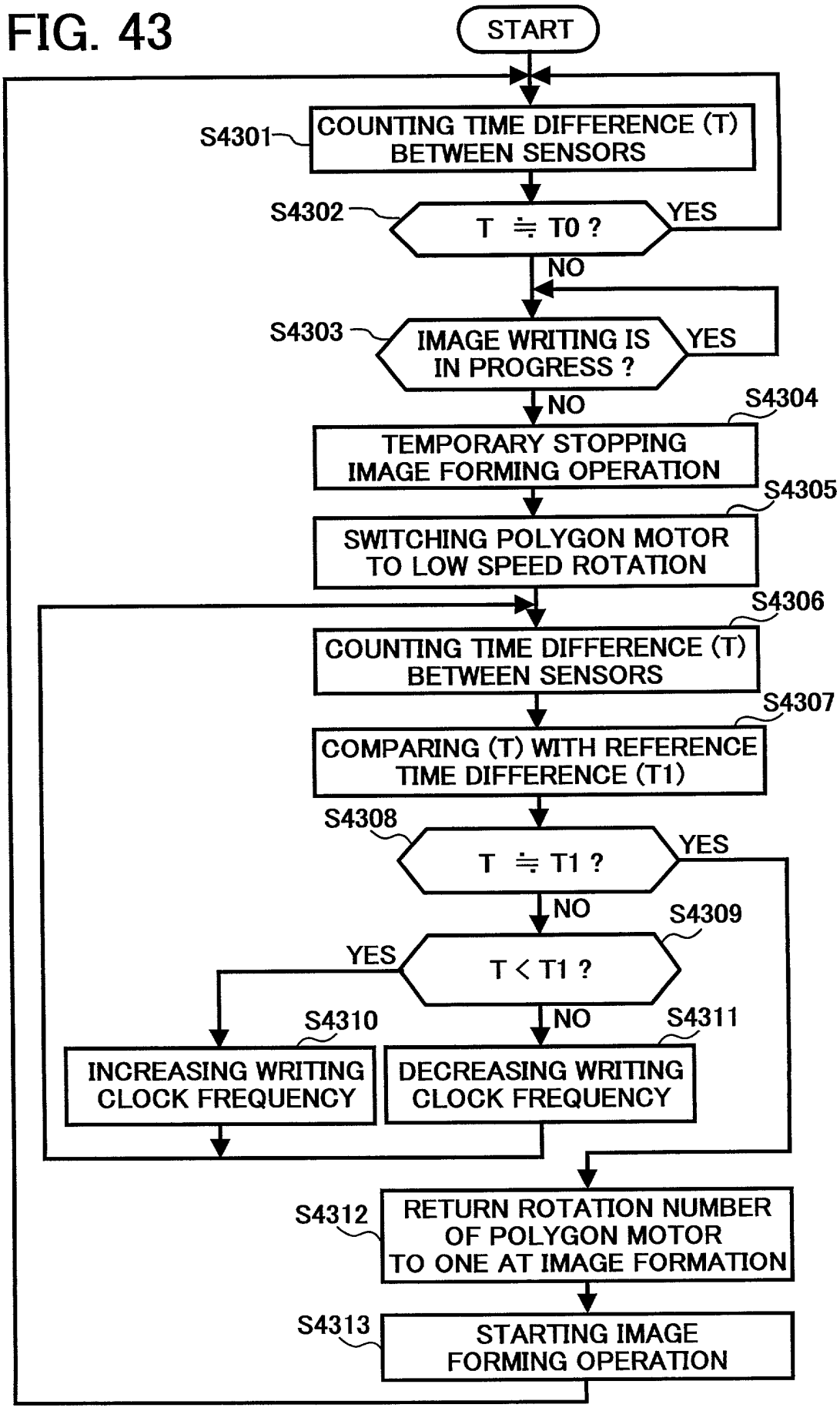

208
PCLK
WCLK
ROTATION NUMBER CONTROL CLOCK GENERATING SECTION
2201
WRITING CLOCK GENERATING SECTION
302
DATA SWITCHING SECTION
3501
REFERENCE TIME DIFFERENCE (T1)
DATA 1
304
COMPARING & CONTROLLING SECTION
REFERENCE TIME DIFFERENCE (T0)
TIME DIFFERENCE (T)
TIME DIFFERENCE COUNTING SECTION
303
DETP1 DETP2
CLK

FIG. 43


START
S4301
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S4302
T ≒ T0 ?
YES
NO
S4303
IMAGE WRITING IS IN PROGRESS ?
YES
NO
S4304
TEMPORARY STOPPING IMAGE FORMING OPERATION
S4305
SWITCHING POLYGON MOTOR TO LOW SPEED ROTATION
S4306
COUNTING TIME DIFFERENCE (T) BETWEEN SENSORS
S4307
COMPARING (T) WITH REFERENCE TIME DIFFERENCE (T1)
S4308
T ≒ T1 ?
YES
NO
S4309
YES
T < T1 ?
NO
S4310
INCREASING WRITING CLOCK FREQUENCY
S4311
DECREASING WRITING CLOCK FREQUENCY
S4312
RETURN ROTATION NUMBER OF POLYGON MOTOR TO ONE AT IMAGE FORMATION
S4313
STARTING IMAGE FORMING OPERATION